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NOVEMBER 1995 • ISSUE NO. 83
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Page 48

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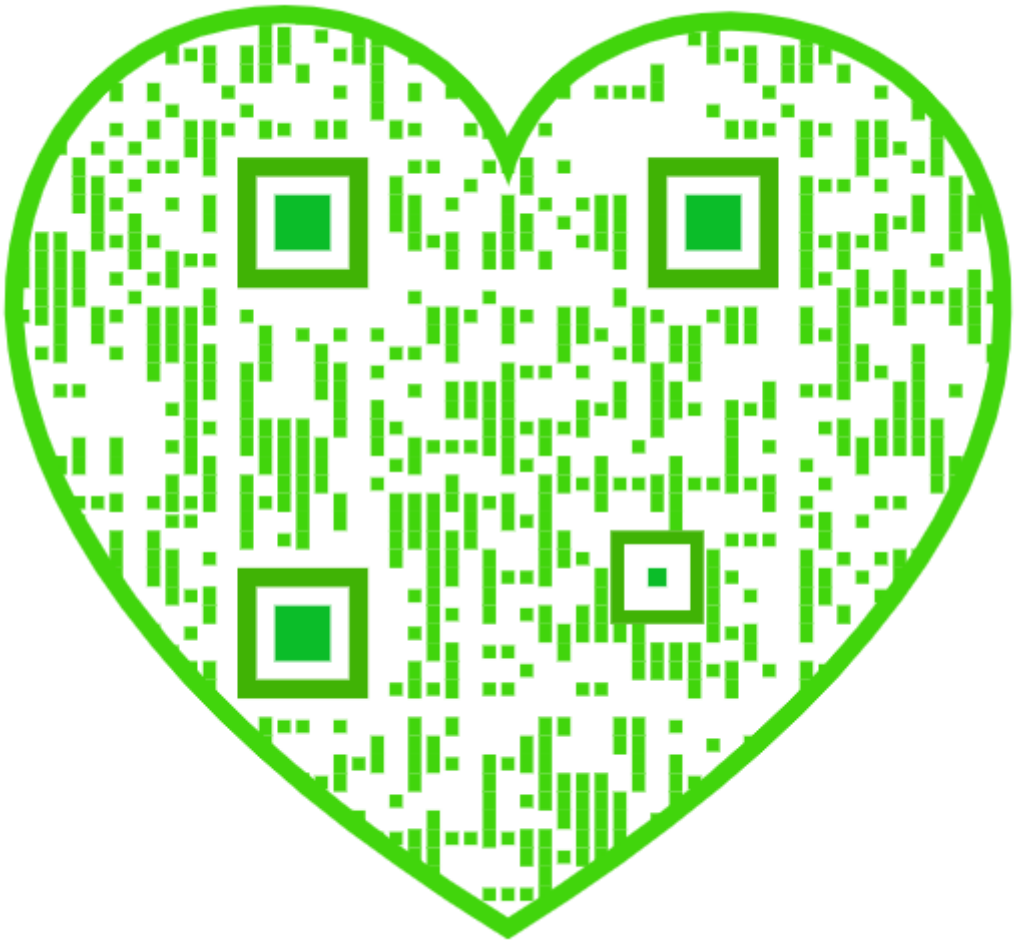

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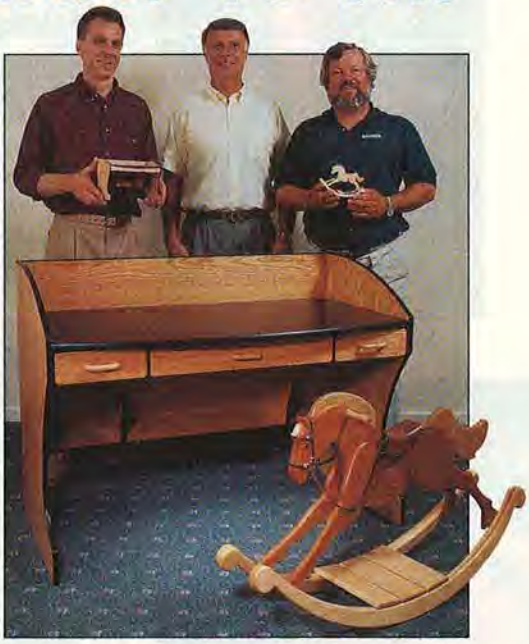
THE EDITOR'S ANGLE

A PROJECT-DESIGN TOOL YOU MAY WANT TO TRY

I don't know about you, but designing woodworking projects is not my strong suit. I can handle the woodworking part of most projects, provided I'm led every step of the way. But there better not be an incorrect dimension on a drawing or an instruction that's not clear, or it'll slow me down considerably.

That's why I'm especially appreciative of the guys on the staff who design many of the really terrific projects found on the pages of this magazine. By the time Jim Downing, our design editor, Jan Svec, the assistant design editor/project builder, and Chuck Hedlund, *WOOD®* magazine's project builder, release a project for write-up, all the details have been tended to. That means that you and I can concentrate on the fun part: building the project.



Jan Svec, Chuck Hedlund, and Jim Downing show off scale models and the prototypes of two projects built in the *WOOD* magazine shop.

Shortly after Jan joined the staff in 1994, I noticed that he and Jim began building full-sized or scaled models of some of the projects before construction began. I was curious about this right away, but it wasn't until the other day that we sat down and talked about this part of their design process.

It turns out that there are several good reasons why the guys use this design tool. According to Jim, building models "gives us an opportunity to test our joinery and to see how parts will fit together at an early stage. We also can take a good look at the proportions of the project before we build the full-sized prototype."

Jan adds, "It usually takes only an hour or two to build a model, and if you make a mistake at this stage, so what? Models also alert me to design problems that I might not be able to see if I were depending only on a drawing."

So how can building project models help those of us who don't design projects? Jim cites three ways. "If you're working with a plan and you're not sure the proportions are right, if you want to make a structural change to a project, or if you want to make style changes, building a model is definitely worthwhile."

Both Jan and Jim make ⅛" scale models of large furniture projects and ¼" scale models of smaller projects, usually out of ¼" sheet goods or solid stock. You can, too, by dividing the length and width of each project part by 8 or 4, depending on the scale you're using, cutting the parts to size, and then assembling your model.

Sound easy? It is. And model-building can save you lots of headaches in the building stage. Maybe it's time you give it a try.

Larry Clayton

Print this article

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This issue's cover wood grain: curly walnut

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What woodworkers need to know

HOW TO GET THINGS ROLLING

If your workshop isn't quite large enough—and whose is—you can alleviate a lot of annoyances by making shop equipment mobile. Need to make the best use of your limited space? Want to handle materials more easily? For these and many other problems, the solution just might be as simple as putting something on wheels.

Casters provide a great way to make equipment movable, but using the wrong ones can bring you to a screeching halt. Here are five questions to help you choose the right casters for the job:

The stem on a typical light-duty furniture caster snaps into a socket like the one shown in the cutaway leg.

1

1. How heavy is the load?

Begin your quest for the correct caster by determining the weight of the load you'd like to roll around. You don't have to accurately calculate the weight down to the last ounce; a realistic estimate is good enough. When you're estimating, though, be generous. (The manufacturer's shipping weight is a handy figure to use for tools and equipment.)

Take *everything* into account as you calculate the load. Include not only the weight of the tool, motor, and stand, but also the weight of any accessories—outfeed rollers or table extensions on a tablesaw, for instance.

Consider your usual shop practices, too. If, for example, you routinely flop full sheets of ¾" plywood or particleboard onto your tablesaw for cutting, figure on another 100 pounds of load on the casters carrying the saw.

Once you've determined the total weight, divide it by the number of casters you'll be using—probably four—to find the minimum load rating necessary for each one. If you want to put four casters on a tablesaw weighing 270 pounds, each will need to support 67½ pounds. You'd be safe buying casters rated at 75 pounds, but ones tagged for a 50-pound limit probably wouldn't hold up well under normal usage.

Determining the caster load this way assumes even weight distribution. But, the weight may be biased. For instance, the headstock end of a lathe weighs more than the tailstock end. To put the lathe on four casters, play things safe by dividing the weight by two or three instead of four. Generally, you can't go wrong choosing heavier-duty casters for any application.

2. How do I attach the casters?

Casters commonly mount with either stems, as in Photos 1 and 3, or plates, Photos 2 and 5. Which style to use depends on the item you're mobilizing.

Plate-mount casters are just the ticket for attaching to a solid flat surface, such as the bottom of a box or platform. Legs usually take stem-mount casters.

For a steadier stance, mount the casters as far as possible from the center of the load. Often you can improve balance and stability by

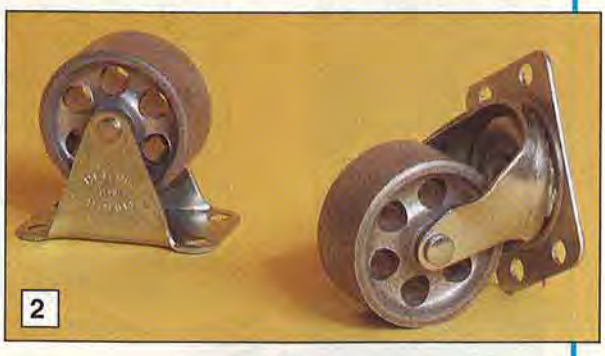

Plate-mount casters, available in fixed-wheel and swiveling styles, mount with four bolts. Plate size, hole size, and hole spacing vary among different casters.

2

Here are three types of stems you'll find. The one at left fits into a hole without a socket. The split ring on the shank holds it in place. The threaded stem screws into a ⅜–16 thread on many manufactured items, but could be installed through a hole with a nut and washers. The plain-stem caster fits a socket that has a retaining ring inside.

3

Continued on page 6

ANY SANDER CAN FINISH. ONLY ONE CAN FINISH FIRST.

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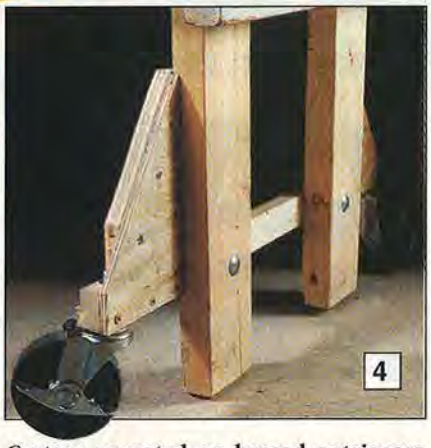
What woodworkers need to know

HOW TO GET THINGS ROLLING

Continued from page 4



Casters mounted on braced outriggers give this tool stand a wider stance for greater stability. When mounting casters this way, be sure to set them out far enough to allow a full 360° of swivel.

attaching them to outriggers, as shown in Photo 4.

To install plate-mount casters, simply position the caster, mark the mounting holes, and drill them. Then, attach the caster with nuts, bolts, and washers.

To install the socket for a stem-mount caster, drill a hole the size of the socket's outside diameter straight into the bottom of the leg. Drill about ¼" deeper than the length of the caster stem. Drive the socket into the drilled hole, then snap the caster into it. Non-socketed stem-mount casters fit into a hole the same size as the stem diameter.

3. What about the wheels?

How easily your castered equipment rolls around depends to a great extent on wheel diameter. Every wood chip, bit of litter, or imperfection in the floor poses a major obstacle for small-diameter wheels. Bigger ones can roll right over such things.

As a general rule, choose casters with the largest wheels possible. Plan to use casters with wheels at least 2" or 2½" in diameter to mobilize heavy shop equipment.

You'll find casters with solid rubber, plastic, or metal wheels. Any type will work for tool mobility. Rubber and plastic wheels, like those shown in Photos 1 and 3, roll smoothly across hard surfaces or carpet. They're quiet and don't mar most floor surfaces.

Metal wheels, like those in Photo 2, are designed for service on rough, hard, chip-littered floors. (That description sure fits a basement or garage shop with a bare concrete floor.) They have high impact resistance, and will stand up to a lot of abuse.

4. How do I make it stay?

Once you mobilize a piece of equipment, you have to keep it from rolling around when you try to use it. Luckily, that problem has some simple solutions.

Locking casters, like the one shown in Photo 5, provide one answer. They immobilize the equipment by preventing the wheels from turning—much the way setting the parking brake on your car locks the rear wheels to keep the car from rolling.

For greatest stability, install a locking caster at each corner. The one shown locks by clamping the frame tightly against the wheel hub. A foot lever sets and releases the brake. Another type features a brake shoe that bears against the wheel tread.

If you don't have locking casters, turn to the old, reliable chock. For convenience, make a U-shaped chock similar to the one shown *right* for each caster.

5. Where do I buy casters?

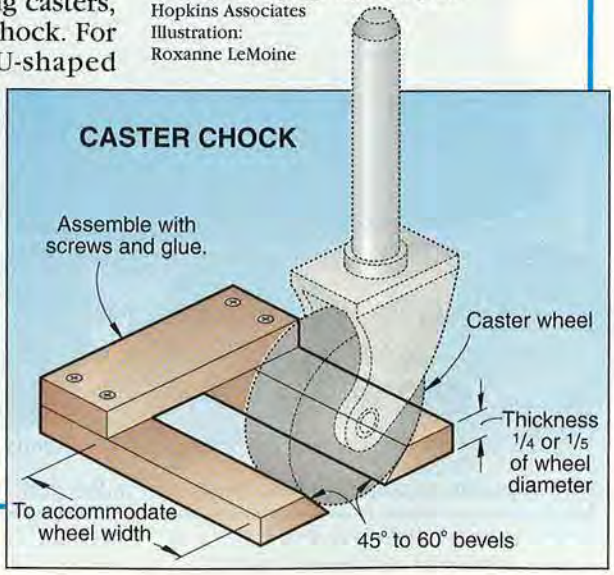
Most hardware stores and home centers sell furniture casters, and many stock a selection of industrial-style casters. Capacity ratings weren't stated in pounds for Asian-made industrial-type casters in some stores we checked; they were identified only as light-duty or medium-duty. The medium-duty would be a safer choice for workshop use.

Step on the end of the lever to lock the wheel on this caster. A step on the other end releases the brake.

Industrial-supply firms (find them in the Yellow Pages under Industrial Equipment and Supplies) usually stock a good variety of sturdy casters. Some of these companies sell to wholesale accounts only, however. And the ones that do sell to retail customers may not accept consumer credit cards or may have minimum-purchase requirements, so call ahead to be sure you'll be able to buy what you need. If you can't buy directly from the supplier, your hardware dealer might be able to order the casters for you.

Surplus or salvage stores are other good places to look for heavy-duty casters. Sometimes, you'll have to sort through a bunch of them to come up with a matching set. You may find the weight rating stamped into the side of the caster.

Photographs: John Hetherington; Hopkins Associates
Illustration: Roxanne LeMoine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5 SUREFIRE STEPS TO SANDING SUCCESS

OK, we'll admit it. We don't like sanding any more than you do. Nevertheless, we pay careful attention to this task because doing it well makes a big a difference in the finished look of a workpiece. Here's how *WOOD*® magazine's project builder, Chuck Hedlund, sands his projects to perfection.

Successful sanding actually starts before you ever touch a workpiece with abrasive. It begins when you select your stock from the local lumber supplier. By choosing pieces that are free of defects such as excessive planer marks or grain tearout, you decrease the amount of sanding you have to do to those boards. And the less sanding you do, the less likely that you'll wind up with sanding marks. If you plane your own stock, be sure to adjust your machine properly and use sharp knives for best results. Likewise, it pays to adjust your saws properly, and to use high-quality, well-sharpened blades.

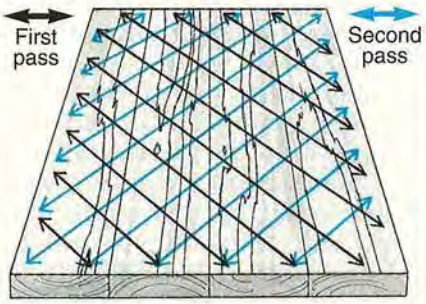
You also can spare yourself a lot of sanding by taking the time to precisely join your workpieces so their surfaces align. By doing so, you can often skip the next step and go directly to Step 3.

2

The sanding process often begins with a belt sander. These aggressive wood removers help you level glued-up panels, or quickly remove defects left by a planer.

In the *WOOD* magazine shop we use 80-grit sanding belts for 90 percent of our belt-sanding tasks. Since 60-grit abrasives leave deeper scratches, we reserve them for those rare occasions when we have to remove more than 1/16" of stock. If you have to use 60-grit abrasive, always follow that with an 80-grit sanding belt before proceeding to the next step. Whenever using 60- *or* 80-grit belts, move the sander *with* the grain only.

If a glue-up still isn't quite flat after using an 80-grit abrasive, we use a 120-grit belt and "fan" the sander diagonally across the workpiece in two directions as shown *below*. Always follow this process by sanding *with* the grain with the same 120-grit belt.



3

Next, follow up with a finishing or random-orbit sander equipped with the same grit as your last belt sanding. If you start this step with 80-grit abrasive, follow that with a succession of 100-, 120-, and 150-grit abrasives.

Note: *If you have a choice between a random-orbit or finishing sander for this step, we suggest you go with the random-orbit model. We find that these machines work faster than finishing sanders, but leave the surface just as smooth, and with fewer telltale "swirly" marks.*

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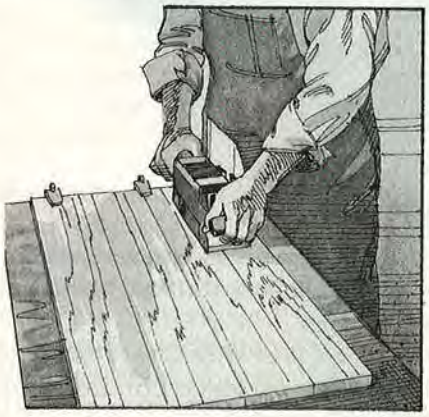

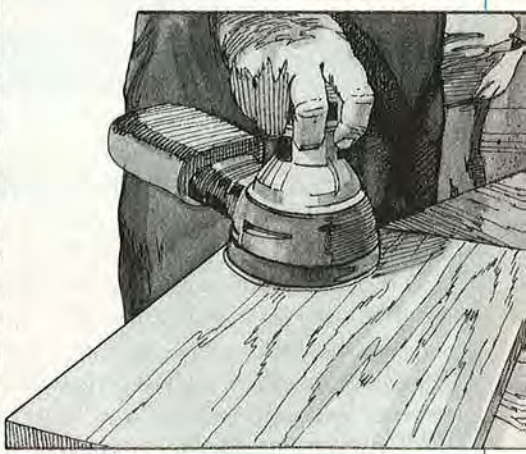

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SANDING SUCCESS

Continued from page 8

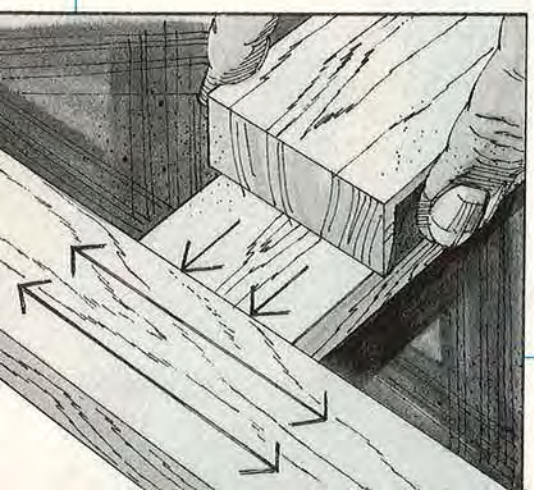
Of course, every rule has its exceptions. If, for example, your workpiece didn't require belt sanding to remove high spots, and it was planed precisely, you may be able to start this step with 120-grit abrasive.

Also, there are two times when you may want to stop this sanding succession at 120-grit. First, with softwoods you might find that 150-grit abrasives will clog quickly. In that case, don't use them. Second, keep in mind that sanding scratches show up less prominently on unstained surfaces. So, we often stop short of 150-grit abrasives on projects that aren't stained, just finished with a clear coat of oil or varnish.

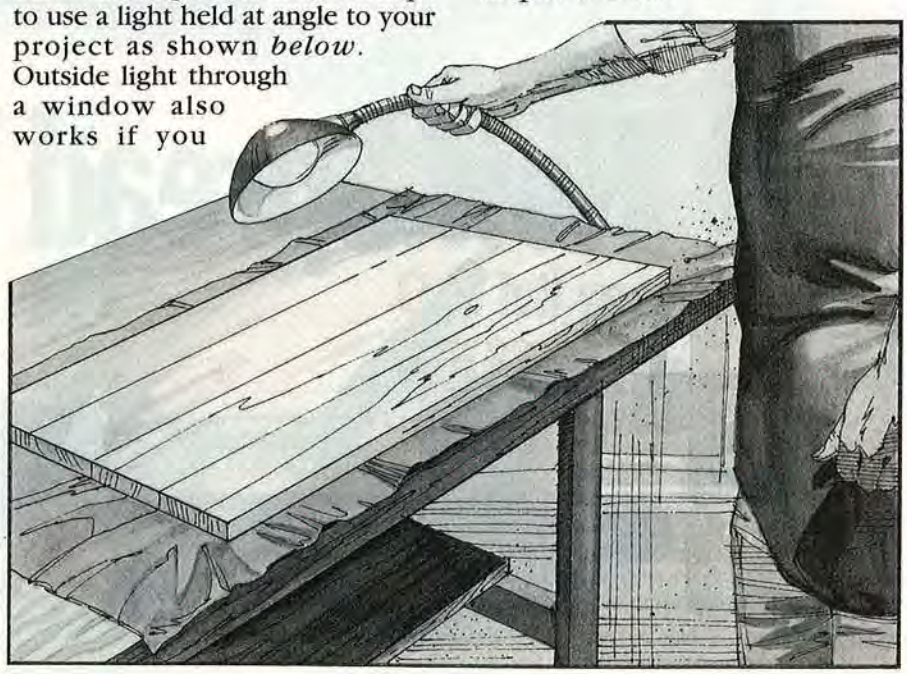
4 Even in this power-tool woodworking world of ours, you still can't top a simple hand-sanding block for imparting a final, scratch-free appearance to a surface. Here again, start your sanding with the same grit that you used during the previous step.

To hand-sand successfully, wrap the abrasive around a flat block of hardwood. Be careful to sand only with the grain. Where the end of one piece meets the edge of another, sand right up to the intersection, as shown *below*, but don't cross it.

You should need to use only one grit, unless you notice that scratches just won't come out. In that case, drop down one grit. Then, go back to your original starting grit to finish up.



5 Finally, closely inspect your project for any remaining sanding scratches. It helps to use a light held at angle to your project as shown *below*. Outside light through a window also works if you can conveniently move the project around in this light. If the light doesn't give you a clear indication, and you're still in doubt about the existence of scratches, you can double-inspect the surface by wiping it down with a rag wetted with denatured alcohol or lacquer thinner.



More scratch-free sanding pointers to live by

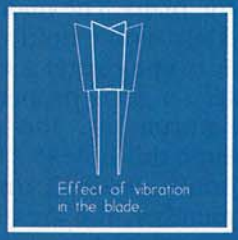
- Keep power sanders moving. If they sit in one spot for even a brief moment they will dig a hard-to-remove gouge or scratch.
- Don't start a power sander until it is in contact with the work surface. And, turn the machine off before lifting it from the surface.
- Never sand across the grain on a veneered surface. Why? You'll have to remove about 1/32" of stock just to get the scratches out.
- Softwoods scratch more easily than hardwoods. So, think twice before using a low-grit abrasive such as a 60-grit belt on softwood.
- You may have heard the expression, "Let the sander do the work." This simply means that you shouldn't bear down on a sander to make it remove stock more aggressively. The harder you push down, the greater the chance that you'll create unwanted gouges and scratches.
- Sand all surfaces of a project uniformly with the same sanding method and grit. This will help avoid uneven stain absorption.
- Vacuum dust and debris off project surfaces between sanding steps. This aids in seeing what you're doing, helps your sander work efficiently, and may prevent you from grinding loose bits of abrasive into a surface.

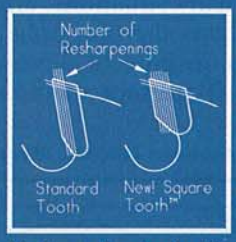
Written by Bill Krier with Chuck Hedlund Illustrations: Jim Stevenson

Wanna' hear the latest in saw blades? You can't!

You can't, because these new blades are absolutely quiet and vibration-free. All other blades vibrate. If you don't believe us, take the blade you're currently using, hold it by the arbor and tap it with a pen or pencil. Hear the ringing noise? That's the vibration, the same thing that happens when you make a cut. Now, tap the blade on this page. No really — try it! That's what our new blade sounds like.

Vibration does more than just make noise. It causes teeth to dull faster and makes the cut less precise. So how do we eliminate vibration? We laser cut patented anti-vibration reeds right into the blade body. The sound gets trapped in the reeds and there you have it, no vibration.





Not only is this the quietest blade, but the most precise. Why? Vibration causes micro-chipping on the edge of the workpiece and the kerf width to vary. We've also incorporated Freud's innovative new Square Tooth™ design — by taking the same amount of carbide as in our other blades and reshaping the tooth to make it thicker and shorter. A shorter tooth is less likely to follow the grain of the wood, thus permitting a more precise cut. A thicker tooth will also yield more sharpenings, extending the life of the blade. Also, our Titanium super micro-grain carbide lasts longer between sharpenings than other manufacturers' carbide.

A higher tooth angle prevents splintering and chipping. So we increased the bevel angle for each blade to give you a splinter-free cut. We have 3 blades to handle any woodworking project: 40 tooth ATB general purpose, 60 tooth triple chip for man-made materials, and 80 tooth ATB crosscutting.

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TALKING BACK

We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, *Better Homes and Gardens® WOOD®* Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. To contact us via computer, use these on-line addresses:
CompuServe: 74404,3516
Internet: 74404.3516@compuserve.com

A change in the phone number

We published the wrong telephone number for Detroit Radiant Products in our September 1995 Tool Buyer's Update on page 26. *The correct number is 800/222-1100. We apologize for any inconvenience this may have caused you.*

Here's to woodworking and your health!

I thought I would send you a copy of a letter I sent to my doctor regarding the positive aspects of the exercise of woodworking:

"On my last visit, when you gave me a clean bill of health, you asked me what I do for exercise. When I said 'woodworking,' you agreed it has some exercise value as it involves a certain amount of reaching. I've been thinking this over, and concluded I could enlarge on the exercise, benefits, and therapy of woodworking.

"I am 71 years old, retired, and I spend between 4 and 8 hours a day in my woodworking shop. In addition to reaching, I walk, bend, kneel, stack, plane, saw, sand, sand, and sand. I twist screwdrivers and clamps, grip pliers, grasp hammers, and do many other hand exercises. I cut various joints (some by hand), assemble the work (both large and small), and again, sand (and sweep and vacuum). All this time, I rarely sit down, except for occasional trips up the stairs to visit and chat with my wife.

"I have to do calculations, make measurements, interpret plans, and make adjustments and changes of my own to each project. In the evening, I will often read woodworking magazines and books, and look through tool catalogs. And I usually go to sleep thinking about the next day's operations (on wood, that is).

"I do these physical and mental exercises 12 months a year, night or day, in rain or shine, or in the midst of a 12" snowfall. I believe there is little of my body and mind that doesn't get used in woodworking. And patience becomes more than a virtue — it is a necessity. As a bonus, when I'm finished I have a project that I can take pride in and use in my home, or give to one of my six children, six grandchildren, or to my friends."

—John C. Gavin, Schenectady, N.Y.

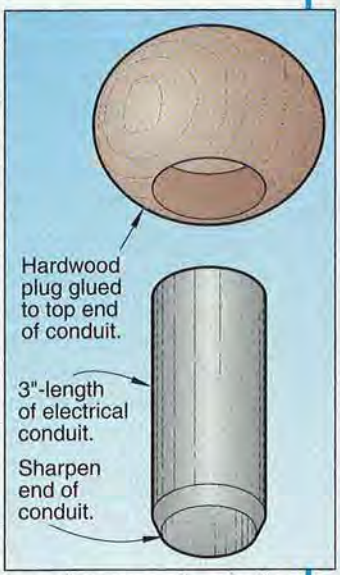
Don't shortchange my pasta allowance!

I enjoyed "The Spaghetti Specialists" pasta-utensils article in the June 1995 issue. But I must warn your readers that they may be placing their spaghetti pot on a diet if they drill the holes in the spaghetti measure as marked in the plans. The middle hole, at 1⅛", won't hold twice as much spaghetti as the ⅞" hole. To get a proper double measurement, you need to enlarge this hole to 1¼". The 1½" hole is correct, as it holds almost 3 times as much as the ⅞" hole. Remember, the area of a circle increases with the square of its diameter.

I've seen this type of error in many situations, and wonder how it originated. (Perhaps the diet police are behind it!) Anyway, I will continue to devote my life to stomping out this evil attempt to minimize the consumption of pasta.

—Harold T. McAleer, Lincoln, Mass.

Plastic washer cutter



The Shop Tip "Keep those toys rolling with plastic washers" in the November 1994 issue brought to mind a technique my brother showed me. We found a simple way to make these plastic spacer washers for our wooden toys. Make a "cookie cutter" from any hard, thin-walled tubing such as ¾" diameter electrical conduit. Cut the tubing about 3" long, and sharpen one end with a file. I added an oversized, hardwood plug to the other end of the conduit as a pad for hammering. Place your new washer punch on flat plastic (such as a coffee-can lid), and strike it with a mallet or dead-blow hammer to cut out the discs. Use a smaller die or a paper punch to cut the axle hole in the washer.

—Gerald Peterson, Auburn, Calif.

Continued on page 16

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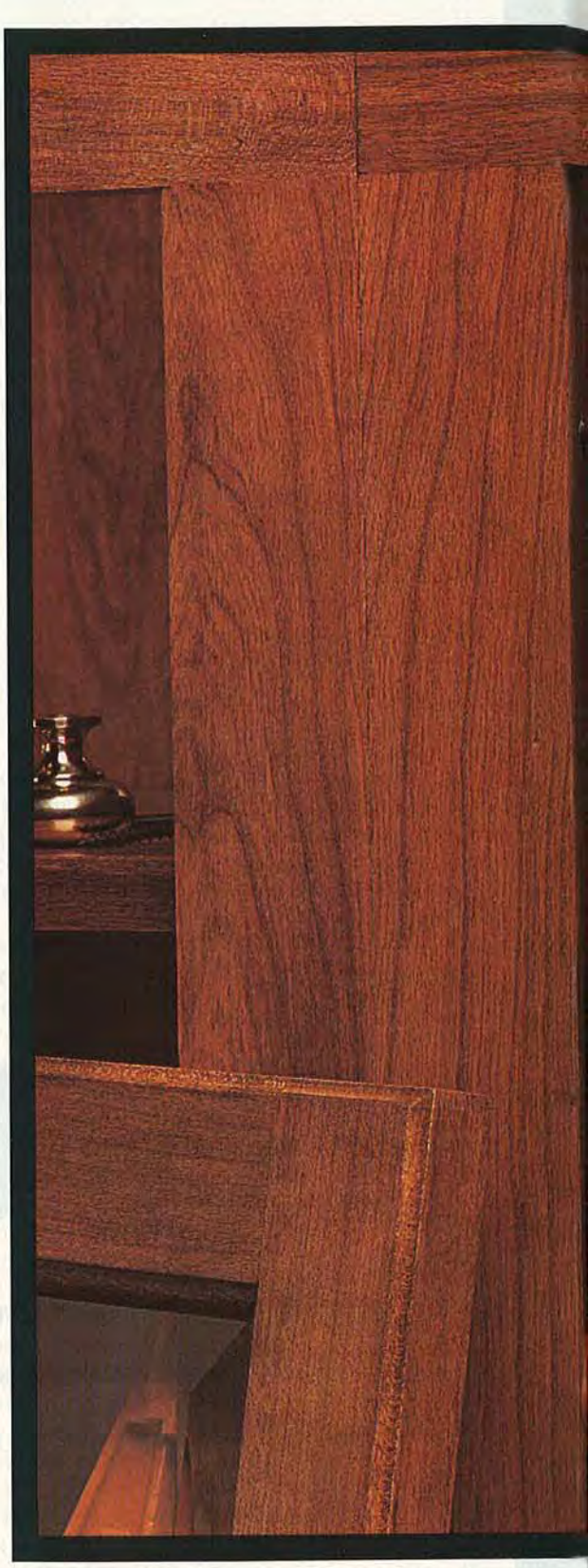

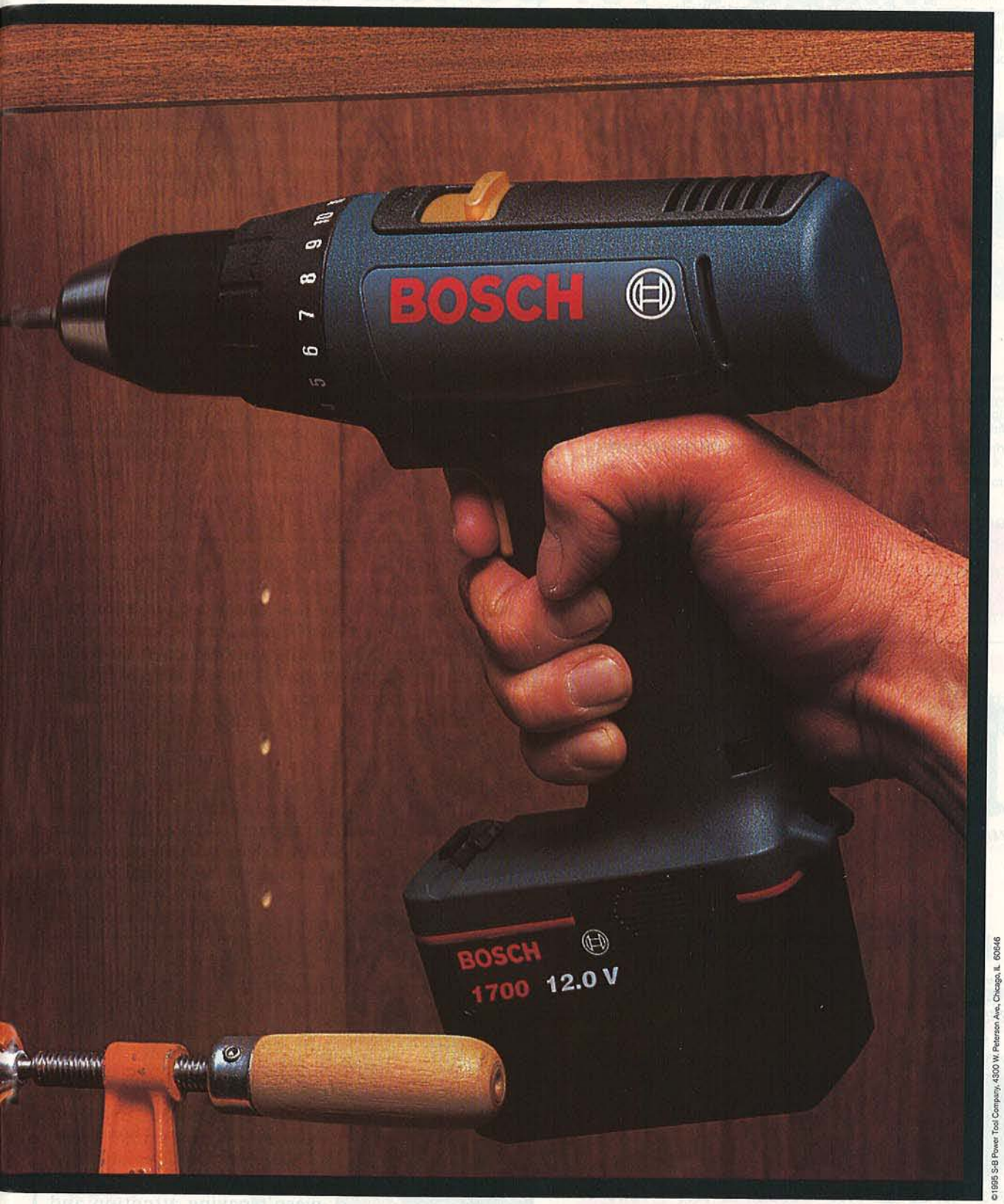

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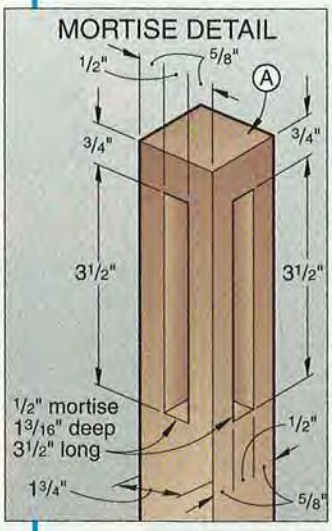
TALKING BACK

Continued from page 12

The article and pattern don't agree

The "Collector's Coffee Table" in the September 1995 issue has conflicting sets of measurements in the article and on the pattern sheet. The Bill of Materials and measurements in the article call for a 1¾"-square leg with a ½×3½"-long mortise. The pattern calls for a 1½"-leg with a ½×4"-long mortise. After checking the measurements of other parts in the article, I assume the pattern measurements are incorrect.

—Robert B. Josbel, St. Charles, Ill.



You are correct, Robert. Build your table using the measurements in the article. And please correct the measurements on the pattern to match those of the drawing left.

Some additional advantages of Excel glue

As a regular user of Excel glue, I felt some important characteristics of this glue were omitted from your June 1995 article "What's New in Glues."

My northern Vermont shop is hard to heat. Consequently, I have found that Excel's ability to successfully bond panels at 45° F. to be of benefit. Other glues can't match Excel's ability for low-temperature curing.

Excel glue requires moisture to activate its drying agents. For wood with a moisture content of 8% or less, the glue manual recommends brushing or spraying water on the surface to be glued. I have found this to be a particularly important part of the procedure during the winter when relative humidity is low.

—Steve Edwards, Peacham, Vt.

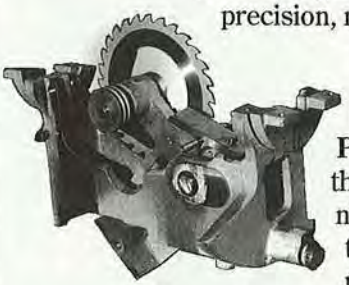
This woodworker is starting early

The greatest testimony to any magazine or article is what the readers do with their newfound knowledge. My 3½-year-old daughter Brooke helped me build and paint the "Fanciful Furniture" toy shelf from the February 1995 issue. (This eventually became two shelf units when Daddy wasn't paying attention and made two left sides.) Keep up the great projects!

—Bill Blaida, Naperville, Ill.

You asked for it again. So, here it is!

Powermatic and Biesemeyer are at it again. And why not? Last year, the response to this free value added package was outstanding, and by your own request, we just made owning the best a whole lot easier. When you consider that over **$300.00 worth of free options** are combined with the precision, muscle, and legendary durability of the **66**, a cheaper saw just won't cut it. On its own merits, the **Powermatic 66 saw** boasts the heaviest cast iron trunnion of any 10 inch saw on the market. It reduces vibration, ensures smoother cuts, and is the primary reason for the lifetime accuracy of this superior saw. To deliver even *more* horsepower to the blade, Powermatic installed a premium high efficiency two-**3VX** drive belt system. And the **66 saw** is the only table saw in its class with a blade that tilts to the *left*, away from the fence (the correct way). In terms of safety, this means less chance of binding between the blade and the fence to reduce kickbacks. Also, bevel cuts are perfect *every* time because chipouts are on the *inside* corner - not on the outside.



To all this, add the perfect companion, **Biesemeyer's T-Square® saw fence system**. It's award winning design utilizes only two moving parts to create an easy gliding, precision fence with a full 50 inch right hand and 12 inch left hand cutting capacity. A hairline pointer and built-in tape makes precise set-ups easier cut after cut. All of which means the **Powermatic/Biesemeyer System** will significantly *reduce* your cutting labor and wasted material. Your projects deserve the very finest cutting system available.

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TOOL BUYER'S UPDATE

New shop-vacuum filter traps super-fine particles

In our April 1995 review of shop vacuums, we found that only the expensive German-made units (costing up to $650) were capable of trapping fine particles down to .3 microns in size. These super-small particles pose the biggest risk to your lungs because they remain suspended in the air for so long, and can lodge in the tiniest air passages deep in your lungs.

Now, W.L. Gore & Associates (the same folks who make waterproof, breathable Gore-Tex fabric for outerwear) have developed a replacement filter that traps 99.7 percent of particles at .3 microns in size. And, it fits on the less-expensive shop vacuums found in most woodworker's shops.

I installed a Gore Cleanstream filter on my Sears shop vacuum and tested its effectiveness with some red chalk dust. In our previous shop-vacuum test, this dust sailed through the cloth and pleated-paper filters found on less-expensive shop vacuums, but the Gore filter stopped it cold. Next, I picked up some dry-wall dust. The filter gradually clogged up, but also proved surprisingly easy to clean with just a few taps. Unlike the porous paper and cloth filters, the Cleanstream filter is a "surface" filter, meaning dust particles don't penetrate its non-stick surface.

Besides working more effectively, the Cleanstream filter stands up well to water (the nemesis of most filters). I immersed my filter in water and even cleaned it with water without any ill effects to the filter.

You can purchase Cleanstream filters that fit most models of Sears, Shop-Vac, Genie, and Hoover vacuums. To mail order the Cleanstream filter that fits your vacuum call the toll-free telephone number listed *below.* Although these filters cost roughly twice as much as standard pleated-paper filters, the money is well spent if you're concerned about breathing fine dust in your shop. And their sturdy construction leads me to believe that a Cleanstream filter will outlast a standard filter, possibly for the lifetime of your shop vacuum.

—Tested by Bill Krier

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Gore Cleanstream filters

Performance	★ ★ ★ ★ ★
Price	$21 to $30
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Rip Fence Technology at its Best

Craftsman's New EXACT-I-RIP Fence and 10" Table Saw

Exact-I-Rip Advantage #1: You get plenty of room to rip even your biggest work pieces–up to 24" on the left side and 30" on the right!

Deluxe miter gauge has positive stops at 90° and 45°. Includes hold down clamp for more precise crosscutting.

Thin kerf carbide-tipped blade stays sharper longer than a regular steel blade for fast, smooth cuts.

Exact-I-Rip Advantage #2: Lock the fence into place–at the front and rear–with just one lever, for consistent cutting width.

Exact-I-Rip Advantage #3: Includes additional aluminum extension to help stabilize table for really large work pieces (such as 4x8 plywood sheets).

Cast iron table and extensions dampen vibration.

The smooth-running 3 H.P. (Max. Developed) capacitor-start, capacitor-run induction motor packs plenty of punch at 120V or 240V to cut stock up to 3-3/8" thick! Notched belt drive and spring-loaded motor mount reduces belt slippage for faster cuts.

Exact-I-Rip Advantage #4: Get pin-point accuracy in setting up your cuts, with the micro-adjust mechanism that lets you align the fence with precision.

Sawdust collection kit makes clean-up a snap.

Exact-I-Rip Advantage #5: Set-up's a breeze, thanks to the high-tech thermoplastic polymer bearing surfaces built into the Exact-I-Rip fence system. The fence always slides smoothly and easily–so you can get right to work!

Think all table saws are pretty much alike? Then you haven't checked out the Craftsman 10" Table Saw and Exact-I-Rip Fence Combo. Stock No. 29911. Together they cut the toughest jobs down to size – with an incredible new rip fence technology that gives you silky-smooth position changes, accurate cuts and a huge appetite for those large work pieces. In fact, the Exact-I-Rip fence is so terrific, we're offering it separately as a retro-fit option for other belt drive Craftsman table saws. Ask for accessory fence 29901.

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TIPS FROM YOUR SHOP (AND OURS)

The next time you come up short, think improvisation.

Necessity is the mother of most shop tips. And when reader Aaron Preisch sent us his improvised band clamp idea *right,* I really got a kick out of it. Anybody who has ever come to a critical stage in a woodworking project only to realize that they lack the necessary tool will appreciate his clever, no-cost solution.

An improvised solution to a common woodworking problem amost always makes a good shop tip. The next time you "jerry-rig" a solution, drop us a line and let us know about it. If we choose your tip, we'll pay you $40, plus you may win the top shop tip tool prize. Send a description of the idea and a drawing or photo to:

Tips From Your Shop
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We try to publish original shop tips, so please send your ideas to only one magazine. Also, please note that we cannot return submissions. Thanks, and keep those shop tips coming.

Tom Jackson
General-Interest Editor

On big projects, pull straps tight with Quick-Grip clamps

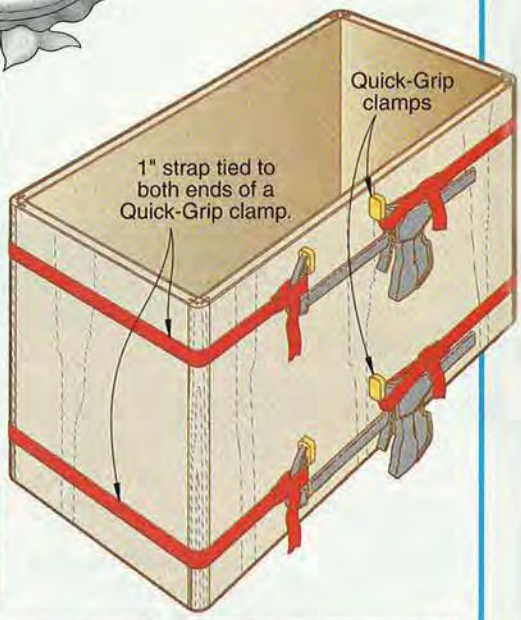
When you don't have enough band clamps, or your band clamps won't reach around a project, you can fashion a good substitute from any strapping material and a Quick-Grip clamp. The Quick-Grip clamp will also give you considerably more clamping pressure than the screwdriver-operated tension mechanism found on band clamps.

Start by opening the jaws of the clamp as wide as they will go. Then tie one end of your strapping material to the non-moving jaw of your clamp. Wrap the strapping around the project with a loose fit, tie off the other end on the moveable jaw, and squeeze the handle.

—Aaron Preisch, Lockport, N.Y.

TOP SHOP TIP

For sending us the top shop tip for this issue, we awarded Aaron a Ryobi JP155 benchtop jointer.

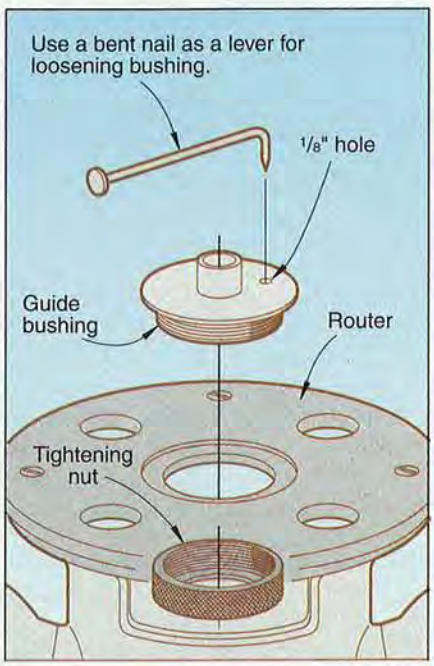


Bent nail prevents damage to your router's guide bushing

Template guide bushings for your router can jam tight after just a little use. If you can't unscrew yours with your fingers, and you don't want to rough up the edge of the bushing with a pair of pliers, try this simple technique using a bent nail.

Drill a ⅛" hole on the edge of the bushing close enough to the center to clear the threads underneath. Then, the next time your bushing sticks, simply insert a bent finishing nail in the ⅛" hole, and push the other end of the nail counterclockwise against the center shaft on the bushing. The leverage from the nail will loosen the bushing easily.

—Henry Borger, Brooksville, Fla.



Continued on page 24

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  Orignal formula now available for use with darker woods.

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Craftsmen everywhere are using the low-cost Woodmaster to **bring in welcome extra cash** and to **save** on all their lumber needs. You can, too!

With the big 18-in. Woodmaster or the standard 12-in. model, you can quickly convert low-cost, rough lumber into valuable finished stock. You can turn out perfect picture frame moldings, crown, bed and base moldings, tongue & groove, door and window trim... all popular patterns...any custom design.

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Just a twist of the dial gives you perfect control for planing, sanding or sawing...from 0 to 1,000 cuts per inch. Creates mirror-smooth molding with no sanding required!

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Woodmaster's Quick-Change Molding Head lets you create custom moldings from any stock. Choose from over 250 standard trim and picture frame patterns...or design your own!

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TIPS FROM YOUR SHOP (AND OURS)

Continued from page 22

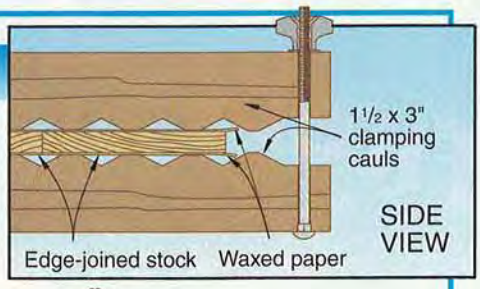
Keep glue-ups flat with these toothy cauls

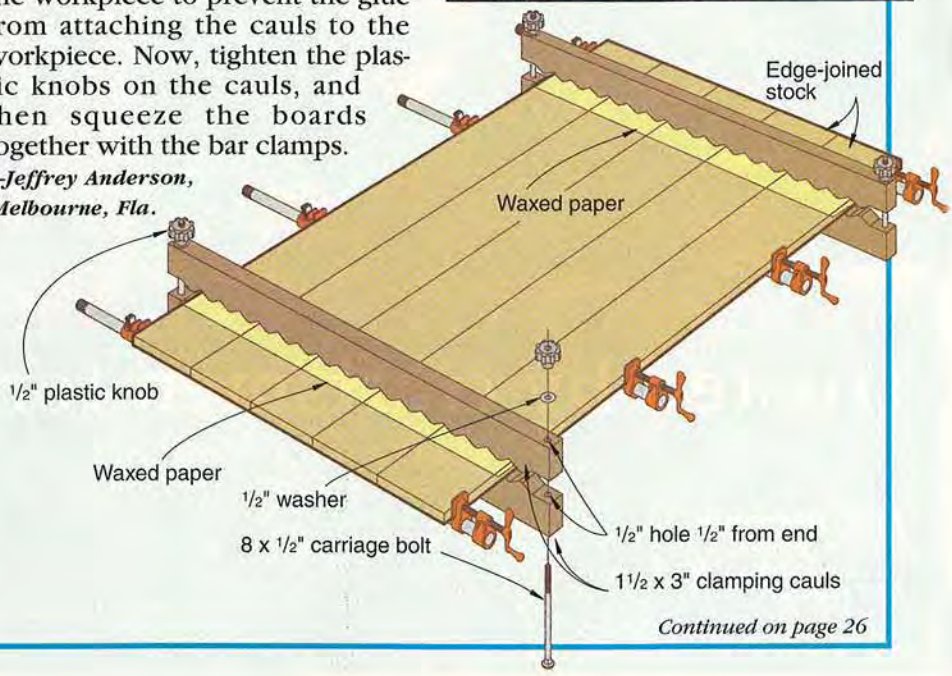
Build two or three of these serrated clamping cauls and you can prevent a lot of sanding due to uneven glue-ups. The serrated teeth provide even pressure across the workpiece so the boards don't ride up on each other when you tighten the jaws of your bar clamps.

Start by cutting the 1½×3" cauls 8" longer than the width of the panels you wish to glue-up. To prevent dents in the workpiece, use a softwood (like white pine). Run the edges that touch the workpiece over a jointer to ensure that they are perfectly straight. Next, cut the 45° tooth serrations about 2" apart and ½" deep. Finally, drill the vertical holes in the end for the carriage bolts, and attach the hardware.

To put the cauls to work, apply glue to the edges of your boards and assemble them, but without tightening the bar clamps. Put wax paper between the cauls and the workpiece to prevent the glue from attaching the cauls to the workpiece. Now, tighten the plastic knobs on the cauls, and then squeeze the boards together with the bar clamps.

—Jeffrey Anderson, Melbourne, Fla.





Continued on page 26

Give Yourself Some Breathing Room.

Model 8-12
Model 10-16

JDS AIR-TECH 2000™

Recent medical studies show that breathing wood dust can be hazardous to your health. The JDS AIR-TECH 2000 will dramatically improve the quality of the air in your workshop.

Our model 350 delivers 350 CFM of filtered air. This will clean the air in a 20 x 20 x 8 foot shop six and a half times per hour. For larger areas, our dual speed model 8-12 will deliver 800 or 1,250 CFM of filtered air for only $495. Our model 10-16 will deliver 1,000 or 1,600 CFM of filtered air for $695.

The JDS AIR-TECH 2000 systems will remove 99% of dust particles as small as five micron and 80% of the particles as small as one micron.

Our unique design makes both ceiling installation and filter changing quick and easy.

For the removal of odors, fumes and smoke, our optional charcoal filter is available.

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Model 350

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FREE $45 IN SHARPENING COUPONS

GOOD ON ALL FORREST OR *OTHER MAKES* OF CARBIDE BLADES OR DADO SETS. EXPIRES 12-31-95.

Must mention *WOOD* magazine for discounts, coupons & bonus with purchase.

CHOPMASTER FOR SLIDING COMPOUNDS & MITER SAWS

New specs, 5° Neg. Pts. & flat, runs out less than .002 for perfect, tight, smooth, splinter-free miter joints.

TAKE EXTRA 10% – 20% OFF FALL SALE!

NEW SIZES AVAILABLE

	LIST	SALE
Delta Sidekick 6-1/2"x40Tx5/8"	$149	$ 89
Sears 8-1/4" & Delta 8-1/4"x60Tx5/8"	$170	$ 99
Hitachi 8-1/2"x60Tx5/8"	$179	$109
DeWalt 8-1/2" & Ryobi 8-1/2"x60Tx5/8"	$179	$109
Delta 9"x80Tx5/8"	$204	$119
Ryobi–Makita & all 10"x80Tx5/8"	$207	$129
DeWalt, Makita, B&D, Hitachi 12"x80Tx1"	$229	$139
Ryobi–Makita 14"x100Tx1"	$266	$179
Hitachi 15"x100Tx1"	$277	$189

For good general purpose cuts use Woodworker II 30T & 40T or Woodworker I. Use small stiffener where possible.

WOODWORKER I – For TABLE and RADIAL SAW

This trim and crosscut ALL PURPOSE blade gives scratch-free polished cuts on all materials RIP or CROSSCUT UP TO 2".

- ALL 60T AND 3/32" THIN KERF 30° ATB and 5° face hook on 10" diameter and under. 12" and 14" are 20° ATB 1/8"K.
- DOUBLE HARDER and 40% STRONGER carbide.
- THIN KERF: Saves 1/3 wood loss on each cut, radial or table. Feeds easy when used for moderate rip and crosscut on table saw. Reduces "JUMP IN" for better "PULL CONTROL." Practically eliminates bottom splinter on RADIAL CROSSCUT.
- Totally stops ALL bottom and top splinter on ply veneers in push-cut mode on RADIAL.
- Our STIFFENER STRONGLY RECOMMENDED AGAINST outside blade for best cuts. Made and serviced in U.S.A. for your benefit.

	LIST	SALE
14"x60Tx1" 1/8"K	$224	$159
12"x60Tx1" or 5/8" 1/8"K	$198	$139
10"x60Tx5/8" 3/32"K	$162	$129
9"x60Tx5/8" 3/32"K	$156	$119
8"x60Tx5/8" 3/32"K	$150	$109
NEW!		
8-1/4"x60Tx5/8" 3/32"K	$150	$109
7-1/4"x60Tx5/8" 3/32"K	$150	$109

RYOBI RA200
SEARS TS200
MAKITA 500B NBA
HITACHI PSM8
PORTER CABLE 368-1

SPECIAL FALL SALE EXTRA 10%-20% OFF

BUY 1 BLADE OR DADO AT **10% OFF** SALE PRICE
2ND BLADE **20% OFF** (EQUAL OR LESSER VALUE)
15% OFF DADO AS SECOND CHOICE.

WOODWORKER II

With this one ALL PURPOSE blade you can RIP & CROSSCUT 1"–2" ROCKHARDS and SOFTWOODS resulting in a **SMOOTH AS SANDED** surface. PLY-VENEERS of OAK and BIRCH will crosscut with NO BOTTOM SPLINTER at moderate feed rates.

- DOUBLE HARD and 40% STRONGER C-4 CARBIDE
- Ends blade changing
- Ends scratchy saw cuts
- Ends second-step finishing
- Ends cutting 1/16" oversize to allow for RESURFACING
- **BUY AND SHARPEN 1 BLADE INSTEAD OF 3**

5/8" holes, boring thru 1-1/4" add $7.50. Larger at Time Basis —Shipping $4.50

WOODWORKER II	LIST	SALE	10%	20%
14"X40TX1"	$215	$149	$134	$119
14"X30TX1"	$195	$139	$125	$111
12"X40TX1"	$183	$129	$116	$103
12"X30TX1"	$162	$119	$107	$ 95
10"X40TX1/8" or 3/32"	$156	$119	$107	$ 95
30T 1/8" or 3/32"	$135	$ 99	$ 89	$ 79
9"X40T	$146	$109	$ 98	$ 87
30T	$125	$ 99	$ 89	$ 79
*8-1/4"X40TX 3/32"	$136	$ 99	$ 89	$ 79
8"X40T 3/32"	$136	$ 99	$ 89	$ 79
30T	$115	$ 89	$ 80	$ 71
7-1/4"X30T 3/32"	$112	$ 69	$ 62	$ 55
**6"x40T 3/32"	$136	$ 89	$ 80	$ 71

*NEW for Sears & Makita Table Saws **New For Saw Boss

THE ONE BLADE THAT LEAVES A SMOOTH-AS-SANDED SURFACE!

BUY OUR BEST SELLER 10" X 40T FOR ONLY $119 PLUS EXTRA 10%–20% OFF FOR FALL SALE!

RECEIVE WITH EVERY FORREST BLADE OR DADO LISTED, 9 SHARPENING COUPONS WORTH $5.00 EACH!

ONLY **$62 or $50** NET COST TO YOU AFTER USING SHARPENING COUPONS

Outperformed 36 other premium blades, both foreign and domestic!
WOOD® Magazine test, Sept. '93, pg. 45

TRY A FORREST CARBIDE BLADE TODAY!

NEW DELUXE DADO-KING!

FROM THE LEADER—20 yrs. IN DADO TECHNOLOGY!

"No tearout on all five woods tested"
(INCLUDES MELAMINE)
Fine Woodworking J/A '91, page 51 "Best Value" WOOD Magazine, Oct. '91, pg. 62,63

- **NEW 3/32" CHIPPER** - allows twice as many groove widths to match thin plywood
- **FREE SHIMS INCLUDED**
- **NO SPLINTERING** - when cross-cutting oak, ply-veneers, and **melamine**
- **PERFECT FLAT BOTTOM GROOVES** - not staggered steps or round-bottoms like a wobble-dado leaves
- **CUTS IN ALL DIRECTIONS** - rip, cross-cut, miter any depth
- **CUTS ALL SIZED GROOVES** - 1/8" through 29/32" in 1/32" increments
- **SUPER-HARD CARBIDE** - gives up to 300% longer life, especially good on plywoods and abrasive particle boards

Dado FOR AS LOW AS $184 *(NET COST AFTER USING SHARPENING COUPONS)*

Here is why this great Dado Head has no equal!

C-4 Carbide Tips — 24 on each saw blade — twice as many as most competitors!

C-4 Carbide Tips — 4 on each chipper with special negative face hooks.

	LIST	SALE	10%	15%
6" D. 5/8" Bore **NEW**	$299	$269	$242	$229
8" D. 5/8" Bore	$321	$289	$260	$245
10" D. 5/8" & 1" Bore	$389	$349	$314	$297
12" D. 1" Bore	$499	$449	$404	$382

(Bore up to 1-1/4" Add $25 — Plus $5.50 S&H)

DURALINE HI-A/T FOR TABLE & RADIAL SAWS

ALL FLAT FACE

5/8" HOLES. Boring up to 1-1/4" $7.50 extra. Larger holes–time basis. Shipping $4.50.

Faster feed rates & absolute splinter control. Stops splintering on OAK/BIRCH PLY VENEERS & MELAMINE.

SIZES AVAILABLE	LIST	SALE	SIZES AVAILABLE	LIST	SALE
7-1/4"x60Tx3/32" K	$149	$129	12"x100Tx1-1/8"K	$253	$215
8"x80Tx1/8" & 3/32" K	$202	$169	14"x80Tx1"	$232	$197
9"x80Tx1/8" & 3/32" K	$207	$179	14"x100Tx1"	$266	$226
10"x80Tx1/8" & 3/32" K	$207	$159	16"x80Tx1"	$262	$223
12"x80Tx1-1/8"K	$212	$181	16"x100Tx1"	$294	$243

Above 1" bore standard.

SPECIAL FALL SALE EXTRA 10%-20% OFF

CARBIDE IS THE HARDEST OF THE C-4 GRADES AND 40% STRONGER, NOT WEAKER!
FOR 50% TO 300% LONGER LIFE.

Standard C-2 Carbide (below, left) and FORREST **still sharp** Oxidation and Corrosion Resistant Sub-Micron C-4 Carbide (below, right). Each shown after cutting 3,500 feet of MDF. Similar results obtained cutting particle board, melamine, and plywood.

STILL SHARP AFTER 3,500 FEET OF CUTTING!

BLADE DAMPENERS-STIFFENERS

FOR BETTER CUTS on all brands of blades, use our large 1/8" DAMPENERS-STIFFENERS against one side.

- **Parallel and flat to .001**
- **Stop vibration, flutter, cutting noise, and blade ring**
- **Tryable and returnable for full cash refund.**

4"	$21
5"	$24
6"	$25

7" AND LARGER AVAILABLE
FULL RANGE OF OTHER INDUSTRIAL SIZES
REDUCES NOISE 50%–75%

WE RECOMMEND OUR FACTORY SHARPENING as some local sharpening creates problems with **MICRO-CHIPPED EDGES** reducing blade life & cutting quality.
3-5 DAYS ON THESE AND ALL MAKES OF FLAT FACE & CONCAVE CARBIDE TIP SAWS. Ship via UPS. Typical 10x40T $15.00, 60T $17.75. Add return UPS $5.00, $1.00 each additional blade.

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ARROW® presents... THE BRUTE™

■ TEMPERED STEEL BLADE REMAINS RIGID FOR APPROXIMATELY 7 FEET ■ TRIPLE REINFORCED NON-SLIP END HOOK ■ CALIBRATED FOR TRUE ZERO ■ HEAT TREATED HIGH CARBON STEEL RETURN SPRING GIVES LONGER LIFE

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Model # B25Y
THE BRUTE
25'
PROFESSIONAL GRADE
AVAILABLE IN METRIC/INCHES
EXCLUSIVE NON-SLIP END HOOK
TRIPLE BRIGHT RUGGED CHROME HOUSING
THE BRUTE™ AVAILABLE IN NEON GREEN & ORANGE RULES: 25' ONLY ALSO AVAILABLE, "PROFESSIONAL GRADE" IN BRIGHT YELLOW, 25' & 30'
THE BRUTE™ STEEL RULE BIG BRUTES: 50' & 100'

RUGGED HEAVY DUTY PROFESSIONAL RULES!

AVAILABLE IN SIZES OF:

12'	16'	25'	30'	50'	100'

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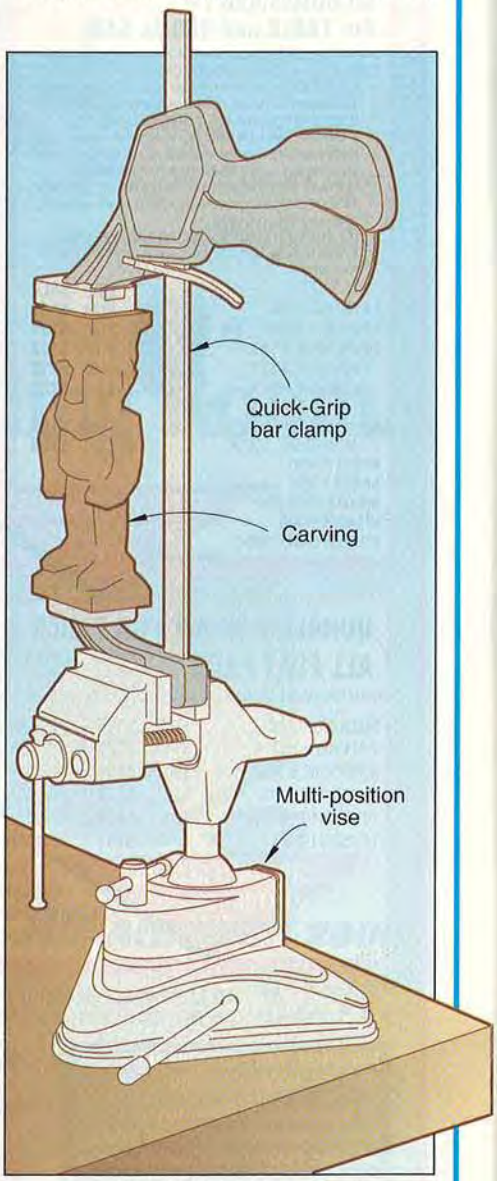
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 24

Bar clamp and vise hold carvings steady

Looking for a way to hold carvings while you work on them? Simply insert the stationary jaw of a Quick-Grip bar clamp between the jaws of a multi-position vise as shown. Presto, you've got an instant carver's vise. To use this arrangement, you'll need to keep the top and bottom of your carving flat so that the bar clamp can hold it securely. An ordinary machinist's vise will also work, but the multi-position vise gives you more flexibility in positioning the workpiece.

—Ernest Guerra Jr., San Antonio, Texas



Continued on page 28

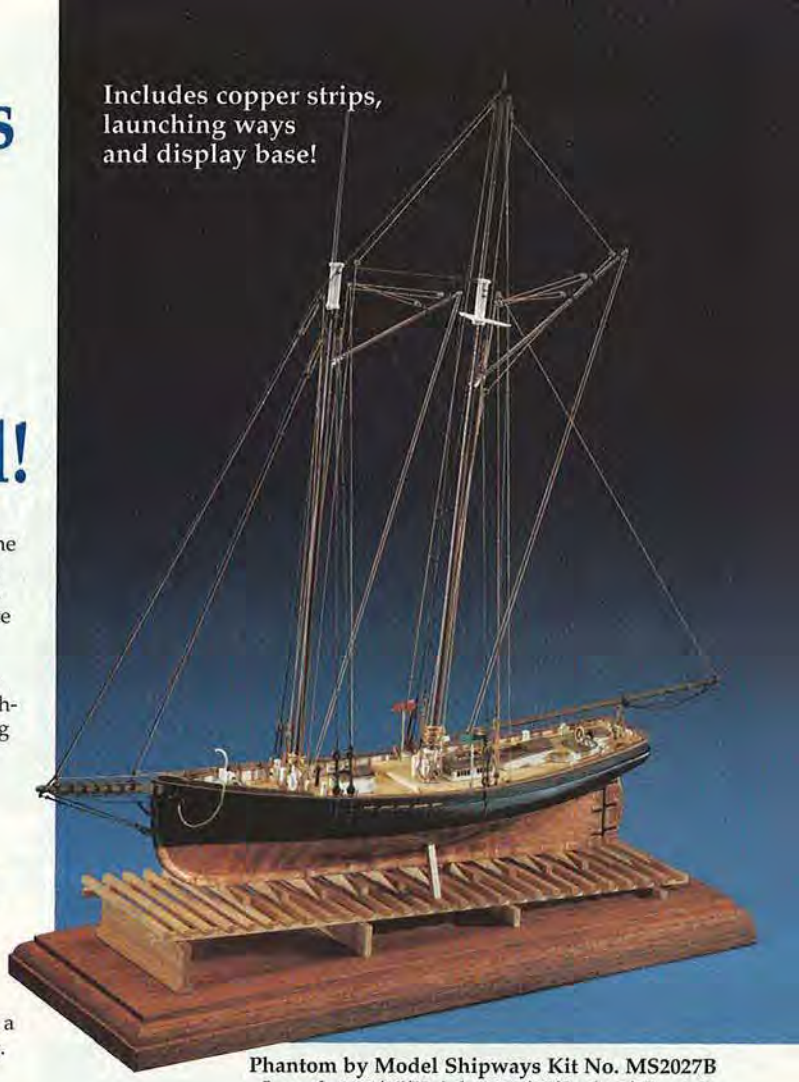
Discover the World's Most Creative and Satisfying Hobby... Build a Historic Wooden Ship Model!

Even if you've never built a model before, you can experience the pleasure and pride of accomplishment wooden ship modeling offers. You can build the two-masted schooner pictured here–a true-to-scale replica, decked out with gleaming brass fittings, delicate rigging–lifelike in every detail.

It's much easier than you think! Working with precise in-scale plans and fine materials, you'll sand the hull, paint and install deck furnishings. You'll add the helm and bowsprit, and apply the copper plating to the hull. Finally, you'll set the masts and rig the lines–just like a shipwright of a hundred years ago. The result? An authentically detailed, museum quality wooden ship model you'll display with pride... a valuable keepsake to be treasured for generations.

The Secret's In Our Kit

We designed our kit especially for the first time modeler. We include all the materials you need to build the model as shown. The solid basswood hull is pre-carved; all you do is a little shaping and light sanding. You'll get wood parts for the cabin and companionways, ready-to-use wooden blocks and deadeyes, solid brass and finely cast metal fittings and three diameters of rigging line. We even give you copper plating to cover the hull! Hardwood display base and launching ways complete the kit. Three sheets of plans and 16 page step-by-step instruction book show you the way to a magnificent model. (Expect to spend 50 to 75 pleasure-filled hours completing it.)



Phantom by Model Shipways Kit No. MS2027B
Length 13-1/2"/Height 13-1/2"/Scale 1/8" = 1 ft.

The Phantom was built for the Port of New York Pilots in 1868. She was lost during the great blizzard of '88, going ashore at Sandy Hook, NJ. Two years earlier, on March 14, 1886, she rescued 852 people from the sinking British liner S.S. Oregon off the Long Island coast. The plans in our kit are a faithful adaptation of the originals.

SPECIAL INTRODUCTORY OFFER WITH FREE BOOK AND CATALOG!

We want to introduce you to this fascinating hobby now! Our regular catalog price for the *Phantom* is $44.99. But for a limited time only, it's yours for just $34.99! And, if you order now, we'll also send you *The Neophyte Shipmodeler's Jackstay*, a richly illustrated 60 page beginner's guide to ship modeling. Selling for $7.99, it's yours–*absolutely free!* You'll also receive a 92 page color catalog showing over 90 ship model kits, hundreds of miniature tools and reference books.

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1. If less than delighted, you may return your purchase in original condition within 30 days.
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Save On A Tool Set!

All the tools you need to build the *Phantom*! Hobby knife, 10 cutting and carving blades, sandpaper assortment, tweezers, three miniature files, block threader and jeweler's pin vise with fine diameter drills–26 pieces in all! Retail Value Over $22.00 **Now Only $14.99**

Model Finishing Set

Includes all the finishing materials you need! 1 oz. bottle of white glue, six 1/2 oz. bottles of Floquil Model Paints (dull black, bulwarks white, bulwarks red, bright oil, glaze and thinner), plus three high quality sable paint brushes.
Retail Value Over $15.00 **Now Only $11.99**

MODEL EXPO, INC.

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Yes! Please send:

__ Phantom kit with free book & catalog - $34.99 (No. MS2027B)
__ 26 Pc. Tool Set - $14.99 (No. MS102)
__ Model Finishing Set - $11.99 (No. PH101)
__ Charge my credit card: __ MasterCard __ Visa

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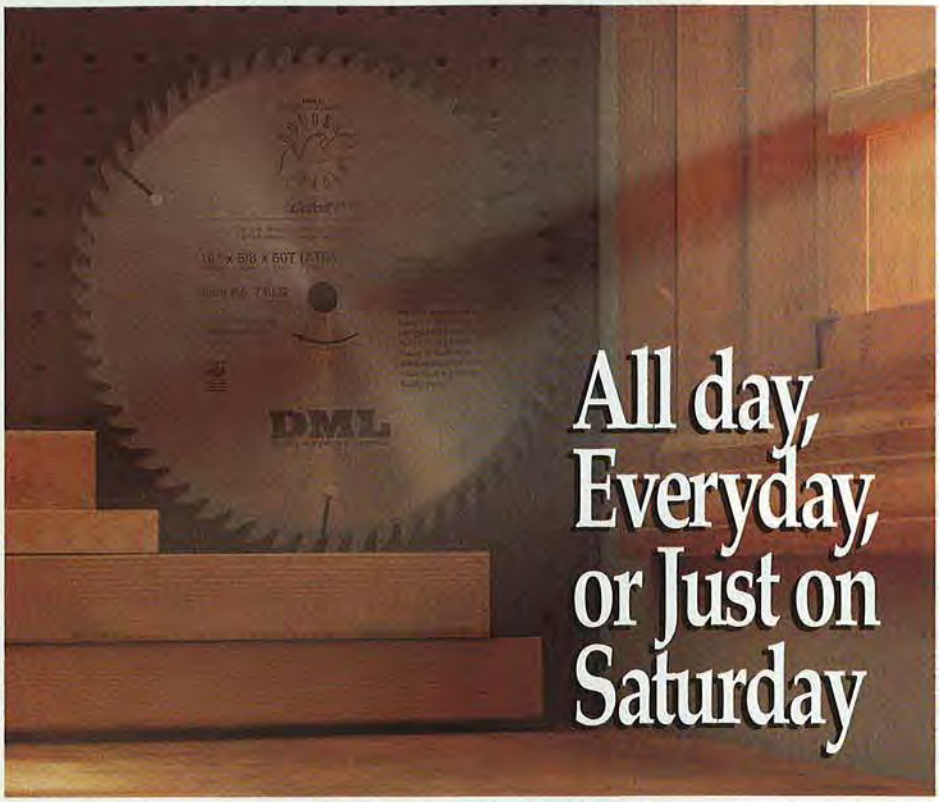
__ My check or Money Order is enclosed.

(Shipping and insured delivery: orders under $45.00 add $4.50; over $45.00 add 10% only. PA residents must add 6% sales tax.)



On the production line or in your workshop, DML precision cutting tools always perform. Over 50 years of woodworking industry experience comes with every American-made DML saw blade.

Our Dyanite® C-4 carbide gives you three to five times longer cutting life. Call 1-800-242-7003 today for your authorized DML distributor.

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The first step to building your own business is calling Guardsman WoodPro. Our mobile furniture touch-up and repair service is expanding into select markets. Guardsman's profit centers include Commercial & Residential, Kitchen Cabinet Refurbishing and Deck Reconditioning. So if you've always wanted to own your own business and you enjoy working with wood, do it with a franchise backed by 80 years of experience in caring for wood. Guardsman WoodPro offers:

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Start-up costs under $20,000

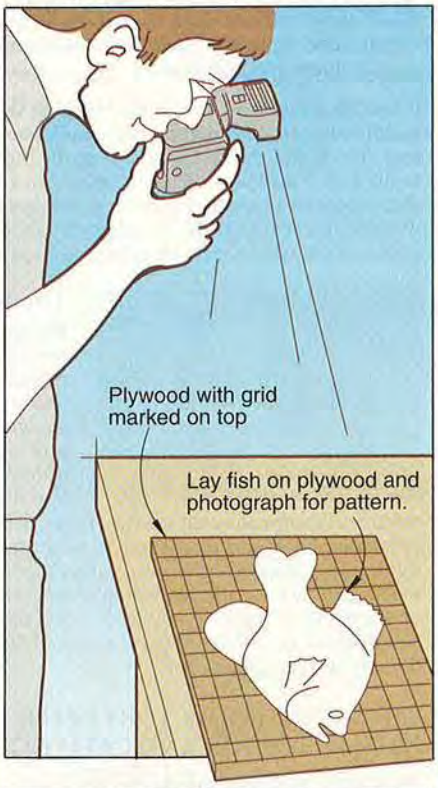
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 26

Gridded pattern gives carvers a ready reference

Next time you're angling for some new figures to carve, make a gridded piece of plywood. Mark or scribe lines at 1" intervals and coat the surface with a marine varnish or polyurethane. Place the catch of the day on the plywood and take a photograph. When the photos are developed, you'll have a scale pattern to work from.

—Russell V. Domer, Okeechobee, Fla.



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- Learn to cut thin strips safely and easily on your tablesaw. Follow the expert advices starting on *page 62*.
- If you've ever discovered sanding marks on a workpiece after you stain it, our sanding skills story on *page 8* shows you how to avoid this mishap.
- Are you stumped by the math required to figure compound miter cuts? Check out the computer story on *page 78*.

ENLON®
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The Power You Can Trust

FALL SEASON Sale!

Enlon is now in its 4th year of serving you with innovative new products and improvements. Enlon's quality far surpasses other brand name, products that look like Enlon's, such as the Enlon 10" Heavy-Duty Table Saw model #EN3202, Oscillating Vertical Spindle Sander model #EN3407, and more.

10" TILTING ARBOR SUPER HEAVY-DUTY TABLE SAW MODEL #EN3202

This industrial quality table saw features a heavy-duty cast-iron table top, 3 H.P., 220V, 15 AMPS, single phase motor, Enlon exclusive self-aligning 36" rip fence system, heavy-duty steel stand with dust collector port, magnetic safety switch and much more.

Reg. $795.00
$735.00

6 #EN3202R 56" CAPACITY EXTENSION RAILS $185.00
Table top not included.
5 OUTFEED ROLLER ATTACHMENT
#EN3227 (w/18") $160.00
#EN3228 (w/37") $220.00
1 #EN3225 HEAVY-DUTY SLIDING TABLE $550.00
2 #EN3229 SWITCH SWING MOUNTING BRACKET $16.00
4 #EN3226 MICRO-ADJUSTMENT KIT $20.00
3 #EN3221 MOTOR COVER $50.00

NEW! 24" DUAL DRUM SANDER MODEL #EN3409

This is the newest Enlon innovation with a full 24" sanding area, three rubber coated hold down rollers, and all sealed ball bearing construction. The quality of this machine is far beyond the introductory price that we're offering right now.

- 5 H.P., Single Phase, 220 Volt and 25 AMP Main Motor
- 1/4 H.P., 220 Volt and 3 AMP Belt Feed Motor
- Magnetic Starter and Reversing Switch
- Twin 6" Diameter Rubber Coated Drums
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- 2 Built-In 4" Dust Collector Ports

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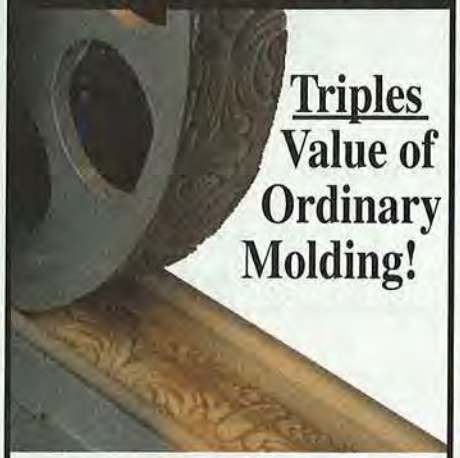

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GREAT IDEAS FOR YOUR SHOP

RADIUS-SANDING JIG

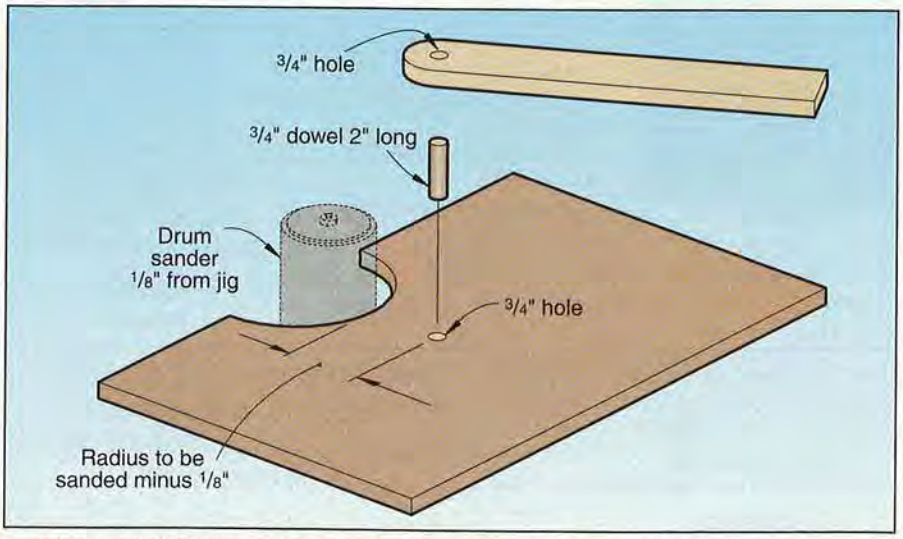
Get the perfect results you want in seconds

Sanding an even radius on workpieces like those used in the Young Artists Activity Center, *page 70*, can be tricky, especially if you're doing it freehand. But you can take the guesswork out of this process in a hurry with this quick-fix jig. To use the jig, you'll need an oscillating spindle sander or a drum sander attached to a drill press.

On the edge of a piece of ¾" plywood, cut out a half circle that will accommodate your largest sanding drum as shown *below*. From the edge of this half circle, measure to a point ⅛" short of the radius to be sanded, and bore a ¾" hole where shown. Now, glue a ¾" dowel in the hole. The accuracy of the jig depends on the dowel standing 90° to the plywood, so leave the dowel long enough to check it with a square. After the glue dries, you can cut the dowel to a shorter length.

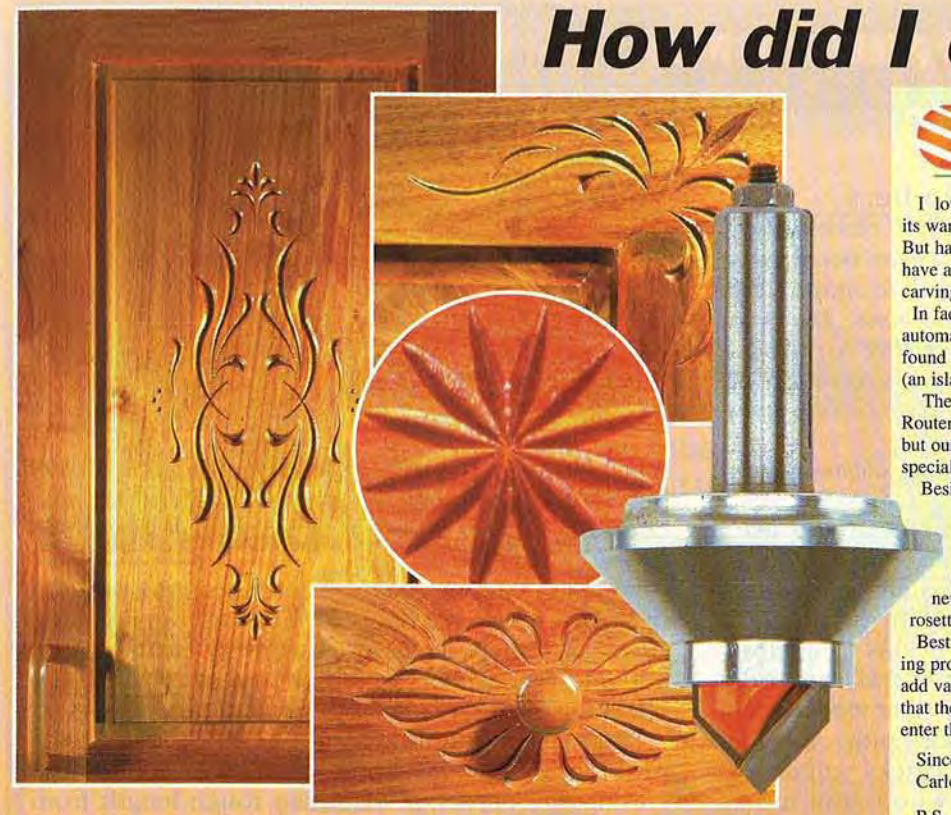
Next, mark the radius on the workpiece, and cut the curve just outside the line. Bore a ¾" hole at the center point of the radius and slip the workpiece over the dowel. Adjust the plywood so the sanding drum just touches the long edge of the workpiece. When the jig is positioned correctly, clamp it to the sanding table, turn the sander on, and rotate the workpiece into the drum to sand a perfect radius.

If you don't want to bore a hole completely through your workpiece, you can bore the hole halfway through the stock, and cut the dowel just short of this depth. For smaller workpieces, you'll want to use a dowel with a smaller diameter.



Project Design: Jan Hale Svec Photograph: King Au Illustration: Roxanne LeMoine

How did I carve these?



I love the look of hand carved wood, with its warmth, beauty and unique personality. But hand carved cabinets, doors and furniture have always been beyond my budget and quite frankly, intricate carving has always been beyond my skills.

In fact, architectural carving is almost a lost art in this age of automation and mass-production woodworking. So when we found this three dimensional router carving system in Tasmania (an island off the southern coast of Australia) we had to have it.

The beauty of this system is that it carves in three dimensions. Router sign-carving systems only have two-dimensional patterns, but our system incorporates a unique angled template guide and special templates to produce true three-dimensional cuts.

Besides the expense and time required, traditional hand-carving has another limitation: it's very difficult to exactly duplicate a carving. The 3D Carving system allows you to produce any design once, twice or a hundred times! With the 3D System, cabinet shops and door makers can add a new dimension to their work. Furniture makers can add rosettes, corner designs and "hand carving" to their pieces.

Best of all, the 3D Carving System is very affordable, providing professional woodworkers with an excellent opportunity to add value and distinctive touches to their work. I'm convinced that the 3D Carver will prove to be the most revolutionary tool to enter the woodworking market in decades.

Sincerely,
Carlo Venditto, C.E.O.

P.S. If your router carvings look "too perfect", just add a few chisel marks for a more primitive look.

I used CMT's exclusive 3D Router Carver™ System

What is the 3D Router Carver™ System?

The 3D Router Carver System is a unique patented method of producing intricate carvings quickly, economically and with complete repeatability. With the Carver Bit, Carver Templates and your 1/2" collet plunge router you can carve any flat wooden surface with designs that rival the work of a professional carver. In fact, the 3D Carver System's speed, accuracy and economy make it equally attractive to the professional or the serious amateur. Besides your router, the system includes three key elements:

1) The 3D Carver Bit: A 1/2" shank, carbide tipped V-Groove Bit is enclosed in a 45º guide bushing. A threaded shaft within the bit's shank allows precise depth adjustment of the tip of the V-Groove bit.

Bit Specifications: Shank: 1/2" Cut diameter: 3/4" Cut Angle: 45º Cut depth: 5/8" Guide bushing diam.: 1-7/8"

2) Template Holding Frames: Clamped or tacked to your workpiece, these frames hold the 3D Templates securely in place.

3) Carver Templates: A total of 46 templates (with more in the works) produce a host of designs for cabinet doors, panel doors, door rails and corners, drawer fronts and many other applications.

How does the system work?

Using the 3D Carver is easy. The bit is installed in the router (1/2" collet only) with the plunge mechanism unlocked so that the router can move up and down as you route. The 45º bushing follows the slots in the template. As the slot gets wider, the router moves downward, so the v-groove gets wider. As the slot narrows, the router moves up and the groove gets narrower. That's it!

How do I get started?

We've made that easy, with a great introductory offer on two of our most popular designs. Our Classical Kitchen Set includes templates and holding frames to make the beautiful Kitchen Door and Drawer Front shown at right, plus a 3D Carver Bit, complete instructions and a free copy of our 3D Carver video. You'll save 20% off our regular prices! We also offer Kitchen Sets in five other designs, plus patterns for four-panel doors, door rails, rosettes & more, so be sure to ask for our complete catalog.

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The 3D Carver System™ & Templates are protected by U.S. patent #5,146,965 & international patents.
The color orange on router bits is a registered trademark of CMT Tools

ASK WOOD

Whether your woodworker's license reads "Beginner," "Intermediate," or "Advanced," you're bound to have a few questions about your favorite hobby. We can help by consulting our staff and outside experts. Send your questions to Ask *WOOD®, Better Homes and Gardens® WOOD* Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. You can contact us via computer at these on-line addresses:
CompuServe: 74404,3516
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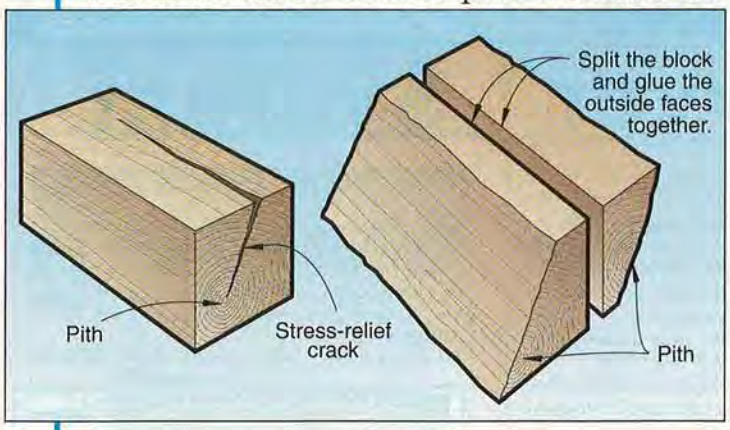
Dealing with cracks in old timbers

Having heard that "old timers" made duck decoys from cedar, I purchased a 6 × 6" cedar beam at a "barn" sale. I then cut a decoy blank to shape with my bandsaw, and roughed out the head. The next day when I returned to work on this carving, I found the blank had developed a diagonal crack along its entire length. Now, I'm wondering, does wood get too dried out or old to use?

—Bruce Fetting, Galloway, Ohio

It's possible that wood can get too dry to use. However, it's more likely that these cracks developed as a reaction to sudden stress changes in the wood brought on by cutting it from the beam.

It's fairly common for building beams to enclose some pith (wood from the center of the tree). And your description of the crack in your decoy suggests the beam you bought includes pith. As a log shrinks while drying, stress-relief cracks will develop in the faster-drying outside wood, and move toward the center wood or pith. The faster the wood dries and shrinks, the larger the cracks will be. You can reduce the chances of cracking or checking in your wood by removing the pith from the wood you are drying.



Sawmills seldom cut the center sections of a log into lumber because of checking problems. However, these remaining center "cants" often become fence posts or other timbers, where the checking and cracking has little adverse effect.

There are a couple of ways to work around the problem of enclosed pith. First, we recommend cutting several decoy blanks to rough length from the beam. Allow these shorter sections to sit for a few days to adjust to the changes before roughing them into decoy forms. This allows the wood a more gradual adjustment to stresses, and the pieces with a tendency to crack may well do so at this point. Select the best of these sections for carving into decoys.

The cracked sections can sometimes be salvaged by splitting them lengthwise along the crack, followed by fastening the outside faces together to reform the block. Joint the outside faces, and glue the pieces together with a waterproof glue (see drawing *left*). This technique moves the pith to the outside of the block where it can be removed while carving and shaping the decoy.

Imitate ebony with aniline dye

My daughter-in-law asked me to build her a dining table with a top of white ash and legs and aprons made of ebony. However, I found the cost of ebony to be beyond my means. What can I use to obtain the even, dark-black look of ebony with a less-expensive wood?

—Clifton Myll, La Quinta, Calif.

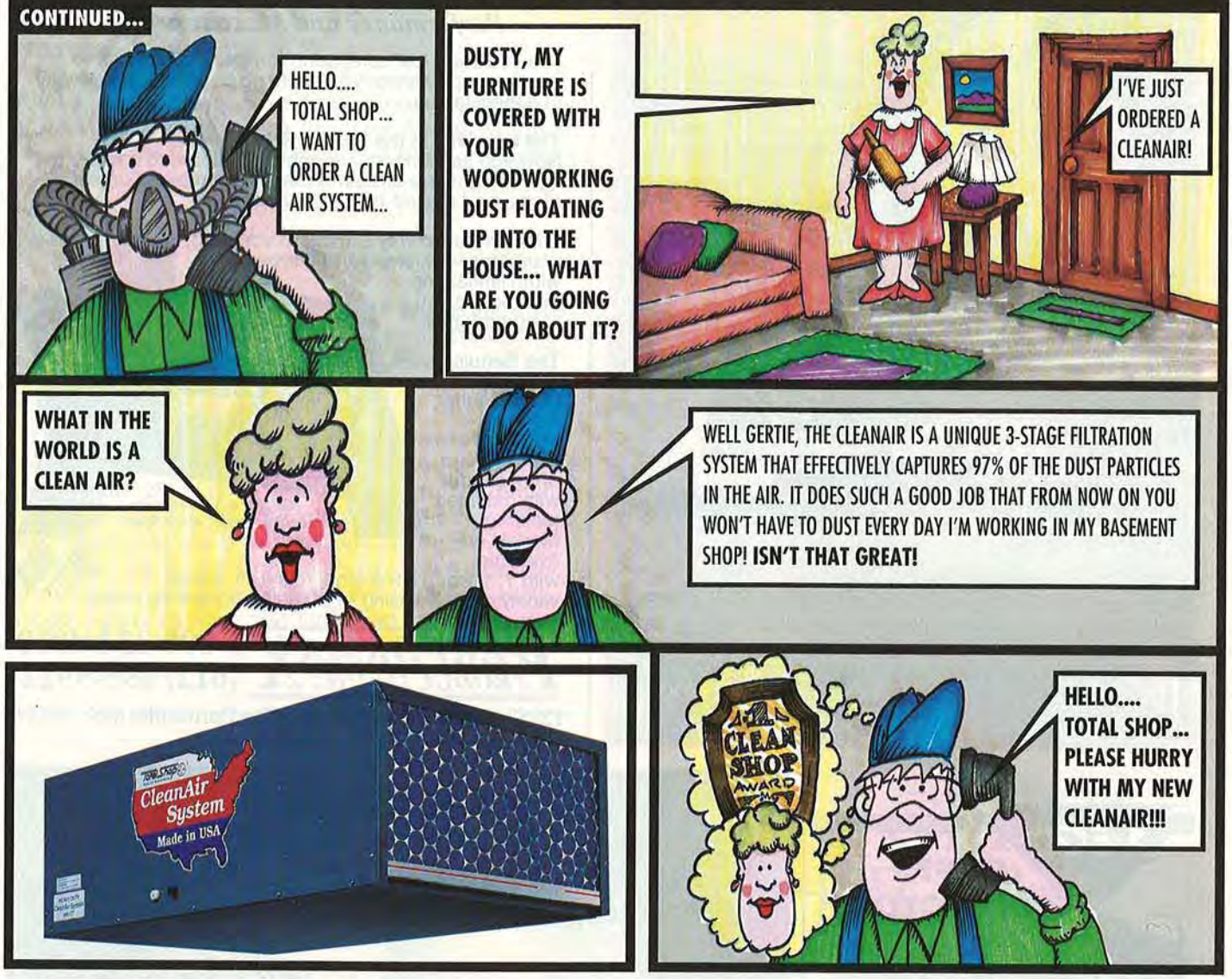
Musical-instrument builders use an alcohol-based black aniline dye to color pearwood and other closed-grained hardwoods, and to even out the color of ebony. This dye penetrates the wood fibers, resulting in an even black color on the wood when dry. For pieces the size of your table legs and apron, we suggest you try this dye with yellow birch or hard maple. Both of these woods have a tight, closed grain, and will approach the appearance of ebony after being dyed.

To use aniline dyes, first sand the wood smooth, working through a series of abrasive grits and ending with 220-grit sandpaper. Then, apply the aniline dye with a foam-type brush, using overlapping brush strokes. Recoat with the dye if needed to obtain the even black color, and, when dry, seal the table with a clear-coat finish.

A 2-oz. container of black alcohol-soluble aniline dye powder, item # 99P60.10, costs $7.50 plus shipping from Garrett Wade Company, Inc., 161 Avenue of the Americas, New York, NY 10013. Call 800/221-2942.

Continued on page 35

The Adventures of Dusty Pyles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ASK WOOD

Continued from page 32

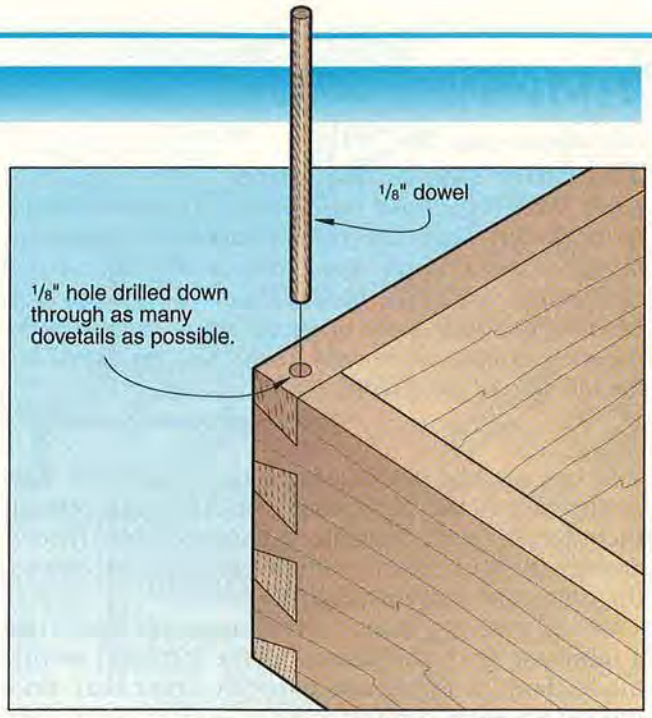
Redwood frustration

I have some very good-looking, straight-grained redwood that I have used in a number of projects However, I am having a problem finding a glue that will hold this wood together. I built a blanket chest with dovetailed joints and am having a lot of problems with the joints coming loose with the slightest stress. What glue should I use?

—Jim White, Grandview, Wash.

Jim, any good woodworking glue will adhere to redwood. We suspect the problems you are having with the joint failure on your blanket chest are more likely due to fiber separation of the redwood than a failure of the glue joint itself.

The lighter-colored, soft and porous earlywood in the annual rings of redwood will readily absorb glue, while glues don't bond well with the much denser and darker-colored latewood. The transition area from earlywood to latewood also has very little shear resistance. Consequently, when stress is applied to a glued redwood joint, the soft earlywood separates from the latewood, and then the weak fibers of the earlywood separate from the hardened glue.



A mechanical reinforcement of the dovetail joints should help solve this problem. Drill a ⅛" hole as far into the dovetails as your drill will allow, from the top and bottom of the joint. Then, apply glue to these holes, and reinforce the joint with a ⅛" dowel (as shown *above*) driven into each hole.

Continued on page 36

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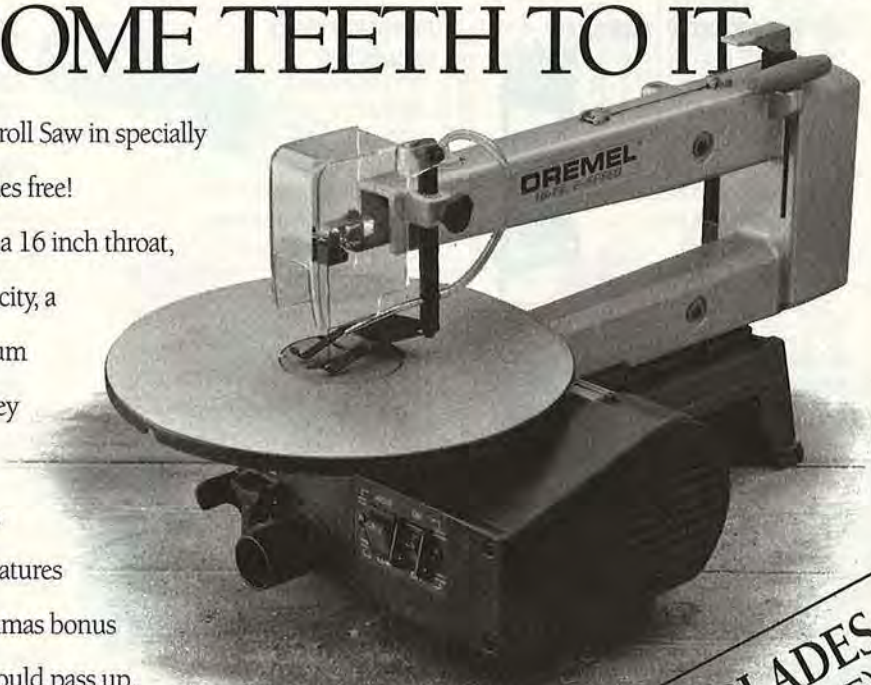

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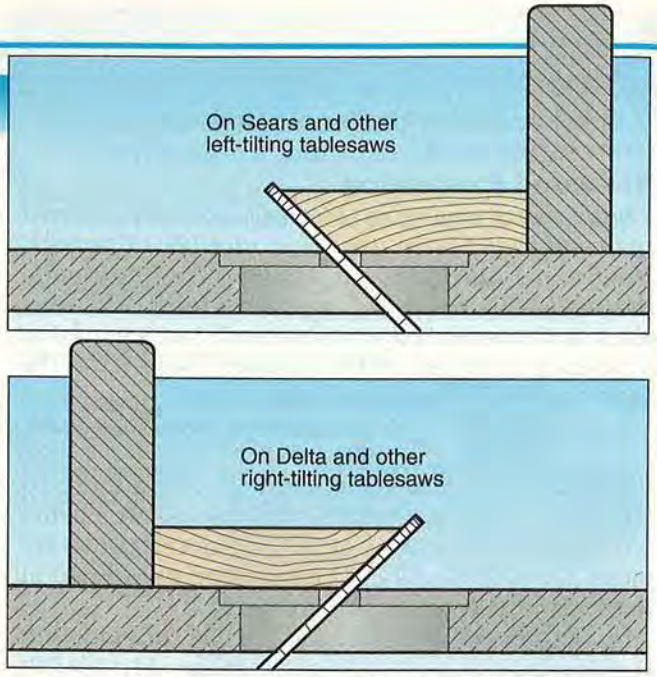
ASK WOOD

Continued from page 35

The other side of the fence

I am thinking about purchasing an aftermarket fence for my Sears Contractor tablesaw. However, many of these fences seem to be used only on the right-hand side of the blade. My original fence can be used on both sides of the blade. Can you give me an example of when I would use my fence on the left side of the blade?

—Theodore A. Baca, Evans, Colo.



You can use the aftermarket fences on either side of the saw blade, depending on how you mount them to your saw. On many tablesaws, these fences are set up with most of their ripping capacity to the right of the sawblade.

We can give you at least two reasons for operating a tablesaw with the fence on the left side of the blade. First, a left-handed woodworker may find this set-up more comfortable and convenient to use than the traditional arrangement with the fence to the right of the blade.

Second, you may want to position the fence on the left side of the sawblade when bevel-ripping long boards on a tablesaw with a right-tilting blade. However, your Sears tablesaw blade tilts to the left, so you can make these cuts on your saw with the fence to the right of the blade.

For our readers who use a tablesaw with a right-tilting blade (Delta, for example), we recommend moving the fence to the left side of the blade for making long beveled cuts. This allows you to more safely pass the wood through the blade with little chance of binding.

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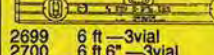

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WOOD ANECDOTE

Print this article

WITCH HAZEL

The tree of the water witch

A forked branch of witch hazel was said to point out water or wealth.

Never growing more than 30' tall and with a thin trunk that removes its hard, close-grained wood from consideration as commercial timber, the witch hazel (*Hamamelis virginiana*) nonetheless may be the most interesting tree of North America. It has associations with missiles, medicine, and magic.

In its extensive range from Canada's maritime provinces south to Florida and west to Iowa, it is the tardiest of trees. For instance, witch hazel's delicate golden flowers appear in late autumn, after its faint yellow leaves have dropped. And the fruits that followed last season's flowers only then completely ripen. But just before the snow flies, the fruit ensures witch hazel's continued existence by ejecting, like missiles, its tiny seeds. They travel 25' or more!

However, it wasn't propelling propagation that attracted settlers to the witch hazel. An aromatic plant, the tree was thought to have medicinal qualities, and extracts of its bark, leaves, and twigs were touted as curative. Although this assumption proved false, witch-hazel extract became a popular ingredient in cologne.

To the new arrivals, witch hazel also seemed to resemble the familiar European hazel, which was said to have magical powers. Legend had it that witches could use the hazel tree to locate both wealth and water. So it wasn't uncommon to find someone "witching" for water with a forked hazel branch.

The divining rod had to have grown so that one of the forks had faced north and the other south for exposure to the rising and setting sun. With a fork in each hand, the water finder let the branch feel the "pull" of hidden water and bend in that direction.

Illustration: Jim Stevenson

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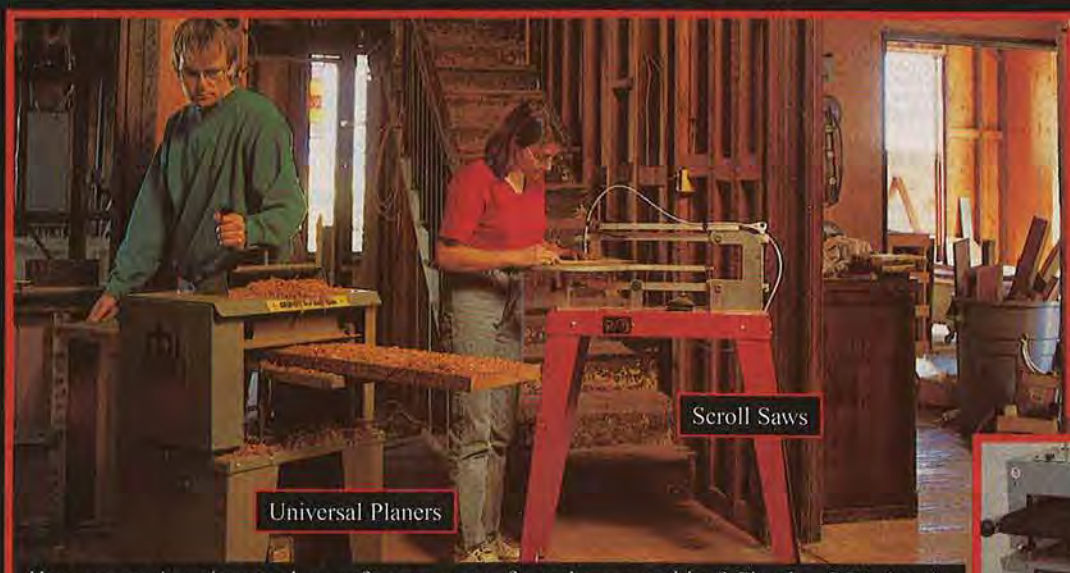

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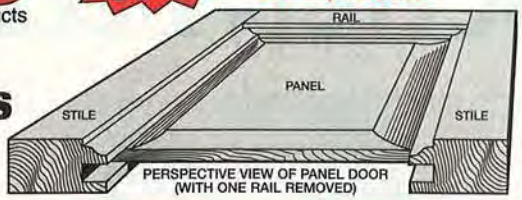

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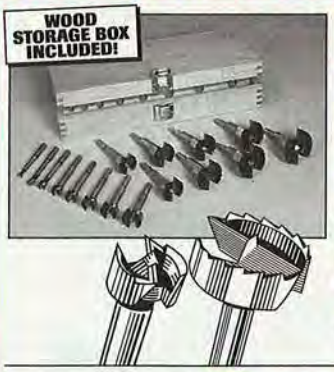

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MERANTI

Frequently called Philippine mahogany, this wood isn't mahogany at all

Identifying, classifying, and naming native American hardwoods becomes child's play compared to the complexity involving what many of us refer to as Philippine mahogany. You see, in the world timber trade, the wood of many species with similar characteristics can sometimes be lumped together and sold under one name. That's the story behind Philippine mahogany.

The Philippine Islands, as well as Malaysia, Indonesia, and Southeast Asia, produce a great variety of hardwoods. But the most volume comes from a group of tree species known commercially as Philippine mahogany, due to the appearance of their lumber and the fact that the word mahogany is widely recognized. However, none of these species belong to the family *Meliaceae* that includes the New World mahoganies of the *Swietenia* genus, such as Honduras mahogany.

Generally, the trees that supply the timber for Philippine mahogany lumber and plywood belong to the huge plant family called *Dipterocarpaceae*. And in that family, the *Shorea* species has five distinct, commercially important trees named meranti.

Wood identification

In the Philippines, as well as elsewhere in their range, *Shorea* trees might be called red or white lauan, tangile, almon, as well as the descriptive "dark-red meranti" or "light-red meranti." But it is meranti (*Shorea spp.*) that makes up the greatest proportion of timber that's sold as Philippine mahogany. (Note: In botanical science, the letters *spp.* after the genus name means that several species in that genus share similar appearance and characteristics, e.g. *Shorea spp.*)

Meranti traditionally grows in well-drained soils at low altitudes. In ideal conditions, a meranti tree can reach a 200' height and a trunk diameter of 6'. A lumberman's dream, it will also be branch free for 90'. The bases of some trees feature the vanelike supports called buttresses.

Light-red and dark-red meranti produce medium-to-coarse textured wood that ranges in color from pale pink to brown and reddish-brown. The grain may be slightly interlocked.

At about 36 pounds per cubic foot air-dry, meranti is heavier than Honduras mahogany. However, it is not nearly as hard nor as strong, and lacks the durability and stability of a true mahogany. And you may find brittleness in some boards.

Natural range

Uses in woodworking

Meranti represents a wood of world-wide commercial importance. As veneer, much of it becomes plywood, plywood paneling, cabinets, and hollow-core doors. In lumber form, meranti is worked into light structural framing, moldings and trim, and low-cost furniture. Meranti has little durability in outdoor projects.

Availability

Home centers and lumber retailers widely stock meranti plywood in a variety of thicknesses. Already milled, it is available as moldings and other interior trim parts. As lumber, you can buy select and better meranti (sold as Philippine mahogany) in up to 2" thickness for about $2.50 per board foot. Veneer should cost about 25 cents per square foot.

Continued

PERFORMANCE PROFILE

meranti

(Shorea spp.)

Light-red meranti

Dark-red meranti

If you have ever machined genuine mahogany, which has been called the wood by which all other woods are measured, meranti will let you down. However, it does not possess any characteristics that could become particularly irritating. *Follow these tips for woodworking success.*

Machining methods

- Medium-to-coarse-grained meranti rips easily, but unless you use a smooth-cutting planer blade, expect to find a rather rough sawn edge of tiny fibers that require sanding to remove.
- Plane meranti to thickness by taking shallow cuts to avoid chipping and tearing.
- Not as hard as mahogany, and a bit brittle, meranti tends to easily tear out or splinter in jointing. But unlike some types of pine and fir that yield long splinters, those of meranti tend to be short.
- Crosscutting with either hand or power tools requires a fence or backing board on the exit side to prevent splintering, known as tearout. This also applies to routing across the grain. Always use sharp bits and blades for the least amount of aggravation.
- On the scrollsaw or with a jigsaw, avoid ragged cuts by sawing with a fine-toothed blade.
- Meranti, unlike some tropical woods (teak, for instance), does not contain extractives or traces of silica, so all types of woodworking glues work well.
- Screws (predrill for these) and nails hold well in meranti.
- Although this tropical wood accepts all types of stains and finishes, you should fill its open grain to obtain the smoothest, most attractive surface. Meranti holds paint well, too, but either fill first or use a good primer coat over its open grain

Carving cautions

- Makers of classical furniture loved genuine mahogany because it could be carved in intricate detail. Not so with meranti. Chipping, occasional brittleness, and its open grain defeat attempts at fine detail that you might want to create.
- To avoid chipping, power carvers should use the less aggressive bits when working meranti.

Turning tips

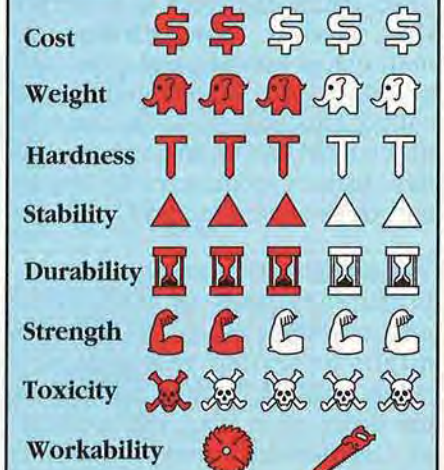
- Round down meranti with a ¾" gouge and a lathe speed no faster than 1,000 rpm to reduce chipping the wood.
- The open grain of meranti tends to collect finishing material if you apply it while the wood is spinning. The result is a wrinkled surface. You'll have better luck turning off the lathe to finish.

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions—and tips pertaining to this issue's featured wood species—appear under other headings elsewhere on this page.

- For stability in use, always work wood with a maximum moisture content of 8 percent.
- Feed straight-grained wood into planer knives at a 90° angle. To avoid tearing, feed figured or twisted grain at a slight angle (about 15°), and take shallow cuts of about 1/32".
- For clean cuts, rip with a rip-profile blade having 24-32 teeth. Smooth crosscuts require at least a 40-tooth saw blade.
- Avoid using twist drills. They tend to wander in the wood and cause breakout. Use brad-point bits and a backing board under the workpiece to reduce wood tearout.
- Drill pilot holes for screws.
- Rout with sharp, preferably carbide-tipped, bits and take a few shallow passes to avoid burning the wood.
- Carving hardwoods means fairly shallow gouge bevels—15° to 20° —and shallow cuts.

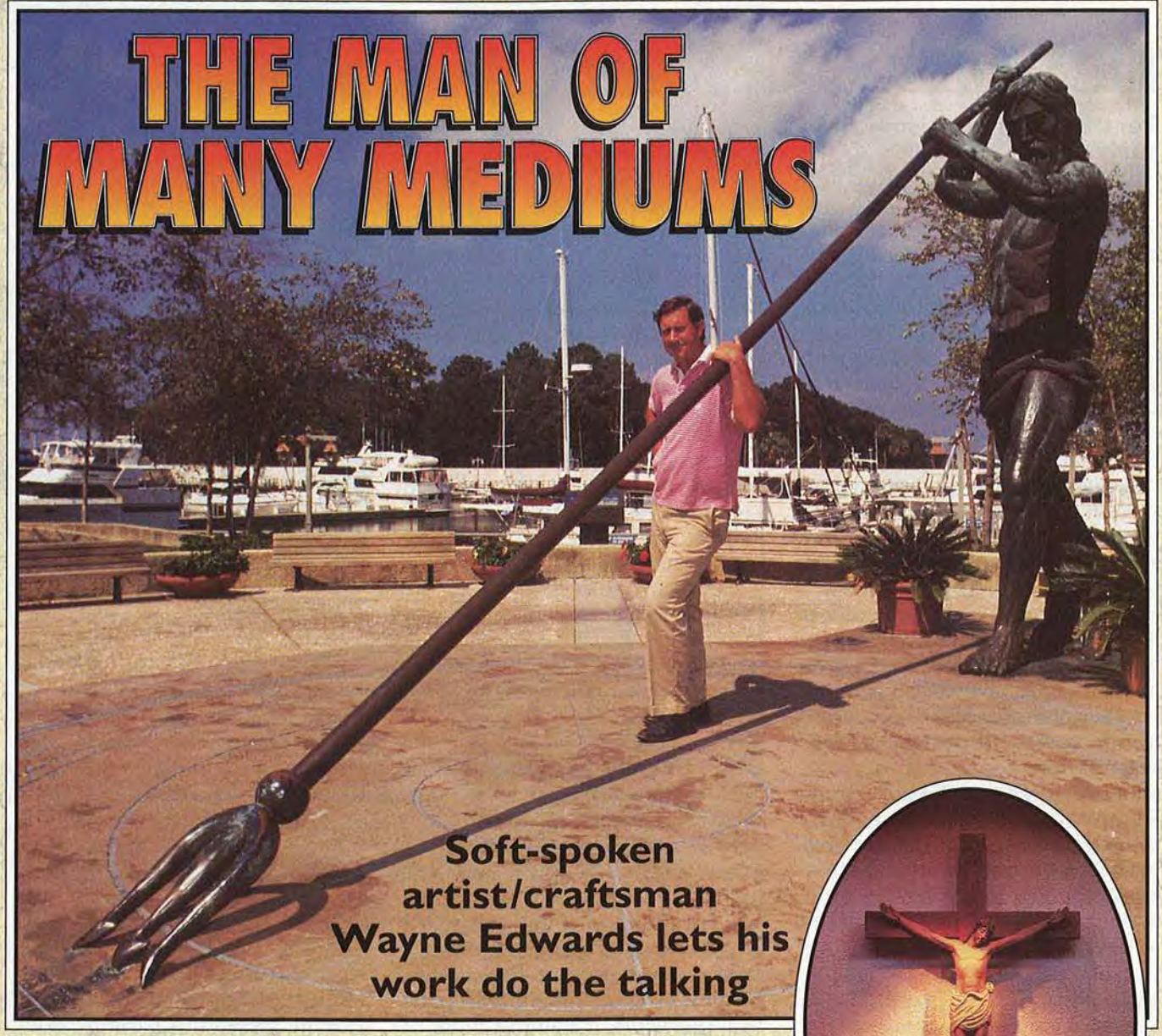
MERANTI AT A GLANCE



Look-alike: Honduras mahogany, African mahogany

Compiled with woodworkers Jan Hale Svec and Lowell Nystrum Illustrations: Steve Schindler

THE MAN OF MANY MEDIUMS



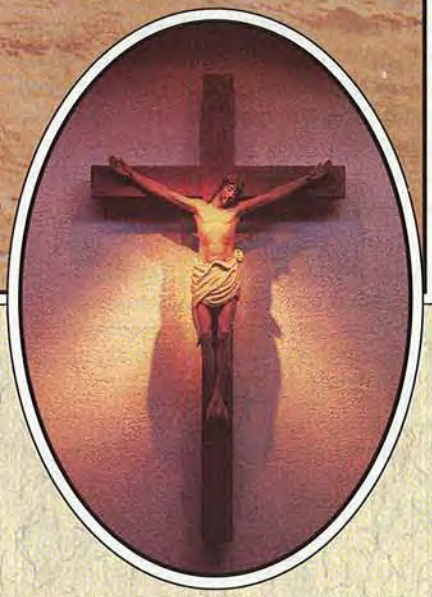
Soft-spoken artist/craftsman Wayne Edwards lets his work do the talking

The first time I saw the 12'-tall bronze King Neptune sculpture/sundial shown *above*, I remember commenting to my wife: "WOW! The person who created this is really talented." I didn't realize how much so until four years later when we returned to Hilton Head Island, South Carolina, for vacation. By accident, I happened onto another of Wayne Edwards' pieces of art. Only this time it was an impressive 18'-tall mahogany carving above the altar in Holy Family Catholic Church.

As I talked with the pastor about the carving, he just happened to mention that the same guy who did the carving also had done King Neptune. I was hooked. I just had to meet Wayne. And now you all can, too.

Continued on next page

Larry Clayton
Editor



Large photo: **"This 25'-diameter bronze sundial, correct down to a minute or less, took me 1 1/2 years to complete. The company that commissioned the work wanted me to put a fence around it, but I feel that people should be able to make contact with it."**

Inset Oval: **"A little bit over life size, this piece is carved of ash. I polychromed (colored) virtually the whole figure in flesh tones and of course some fabric and other details. It took me about four months to complete."**

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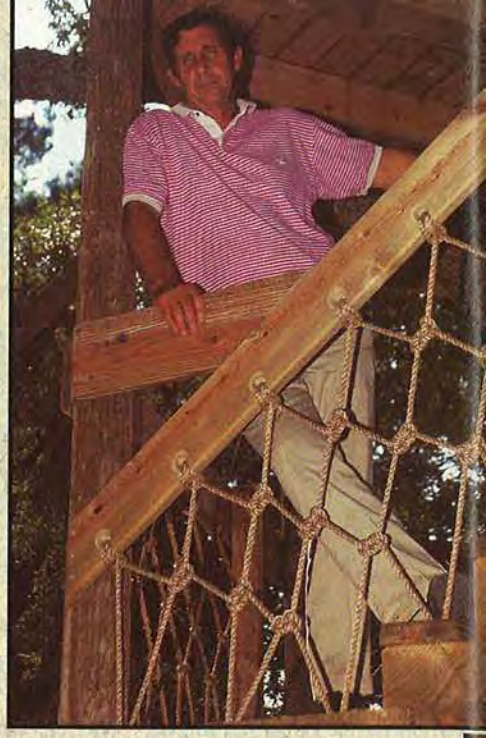
THE MAN OF MANY MEDIUMS



Portrait of the artist—the early years

Growing up in a rural setting near his hometown, Charlotte, North Carolina, Wayne Edwards never gave much thought to being anything but an artist. His carpenter/builder father, perhaps unintentionally, instilled in Wayne a love of building and working with wood. "It was more a matter of watching the things he did and helping him rather than any structured instruction," Wayne offers.

Wayne and his folks didn't get to town very often, so he dreamed up lots of ways to entertain himself. That's how he got into doing things like building treehouses. He built his first one when he was 8 or 9 years old. "I designed them myself as I went, and whenever I needed some manual labor done, I'd recruit some of my neighborhood cronies to do the lifting," says Wayne.

School never was Wayne's thing. He spent the high-school years "mostly goofing off." And the closest he got to art education consisted of one day a year having some paper passed out and being asked to draw something. "I got in good with everybody in the class because I always did their assignment," Wayne chuckles with amusement.

Wayne, now 52 years of age, attended a private four-year art school in Sarasota, Florida, for 1½ years. That was long enough for him to meet his wife-to-be, Ceil, and to decide that he wanted to practice some of the skills he had learned in the classroom out in the real world.

"Actually, I wasn't ready for school," says Wayne. "If I had had any idea what I wanted from school, I'm sure I would have learned more than I did.

"Looking back on it now, though, art school was a great experience. I was around a lot of people who had a lot of talent and who were experimenting with lots of things."

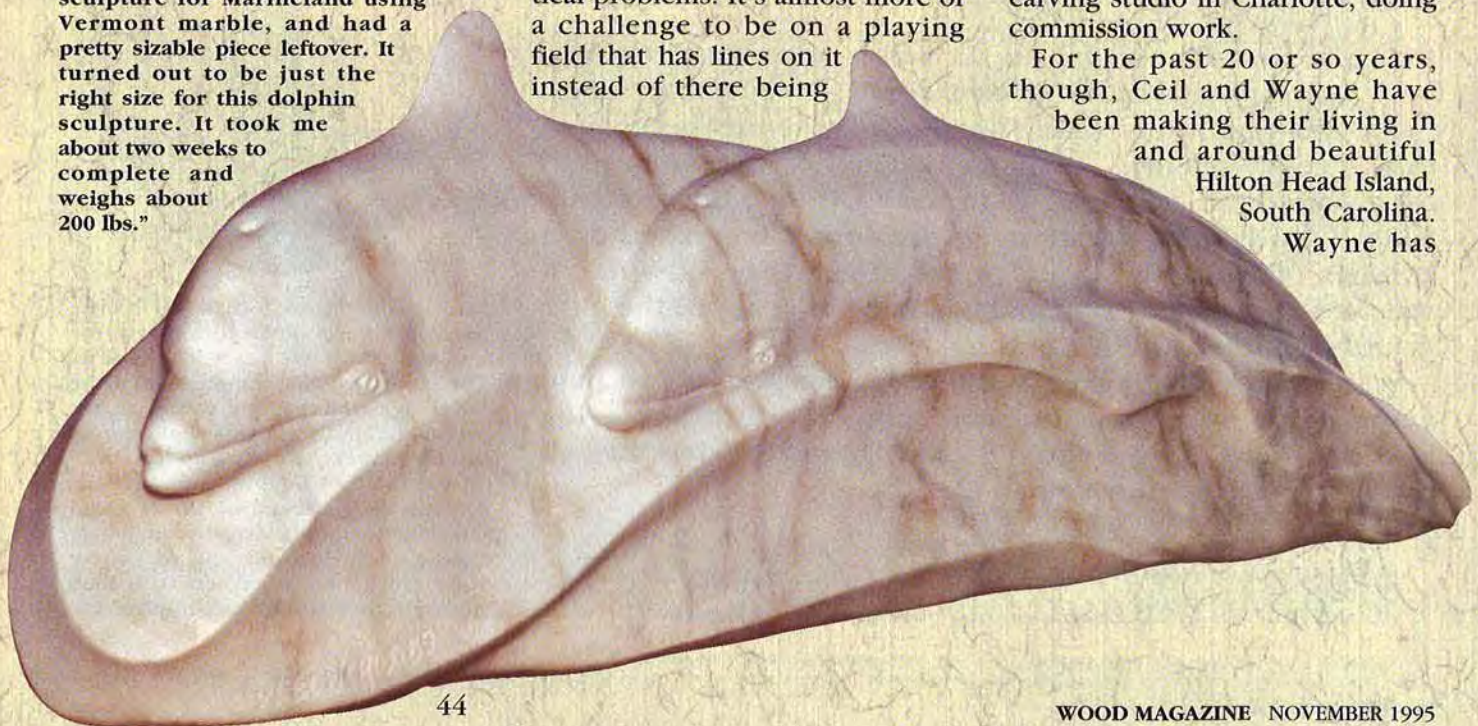
"The next Michelangelo" meets the real world

When he left school, Wayne still was thinking in terms of being an artist of great renown, but that hasn't been the way it has turned out. "I've kind of found out that I get more satisfaction sometimes from doing more practical things, coming up with solutions to practical problems. It's almost more of a challenge to be on a playing field that has lines on it instead of there being no rules, which is the case often with fine art."

After Ceil and Wayne got married and decided not to be art students anymore, they moved back to Charlotte, where Wayne started working with his father building houses. After a couple of years of that, he got involved in doing some three-dimensional display work—similar to what the Disney folks do.

That lasted for about eight years. Then, he quit that job and started doing some woodcarving. He eventually opened up a woodcarving studio in Charlotte, doing commission work.

For the past 20 or so years, though, Ceil and Wayne have been making their living in and around beautiful Hilton Head Island, South Carolina. Wayne has



Right: **"A few years ago I did a large sculpture for Marineland using Vermont marble, and had a pretty sizable piece leftover. It turned out to be just the right size for this dolphin sculpture. It took me about two weeks to complete and weighs about 200 lbs."**

Left: **"When I start on a project like this treehouse, I have basically no idea what it is going to look like when it's finished. I just stand up poles, connect them at some logical elevation, and build the first platform. I've built about 80 treehouses in this country and abroad. I like doing them because I can play like a kid and get paid for it. What more could you ask for."**
Note: Built around a live oak tree, this tree house stands about 35' tall.

Left: **"This structure used to be a little storage shed that wasn't seeing much use, so we decided to make it into a playhouse for the grandkids. They were speechless when they first saw it. And even now, they spend all their time in it. When they get out of the car, they don't even stop at the house."**

done commission work of all types for Sea Pines Development Company and other plantations as well as many other clients.

Which medium does he prefer? That depends.

"Actually, I really like whatever medium it is that I'm working with at the moment. Whatever is called for by the particular job, whether it's stained glass, wood, bronze, copper, clay, anything," says Wayne. "If I had to select one of my favorites, though, it probably would be stone. People have a fascination with someone being able to take a rock and make something out of it.

"Believe it or not, in many cases, it's much easier to work with stone than it is to carve wood. Why? Because you're not dealing so much with grain and with a more unstable material. You don't have to worry about it splitting or cracking or whether it's seasoned correctly or whether you're using the right kind of wood for the project at hand."

A fascination with scale—large and small

Much of Wayne's work, from his multi-story treehouses like the one shown at *left* to the miniature playhouse he and Ceil made for their grandkids (shown *below left*) reflects his interest in scale. "I think what fascinates me the most is having to deal with the technical problems involved," says Wayne. "Working big—bigger than life—can be a problem. If you get close enough to work on it, you can't see what you are doing. You can't see the whole."

He further illustrates his point by talking about one of the grandest of all stone monuments. "If you are carving a Mount Rushmore, you've got to be as much an inventor as an artist because you've got to invent a process that hasn't been invented before. You can't just walk up to a mountain with a hammer and a chisel and start to work without a master plan.

I would have loved to have worked on something like Mount Rushmore. Just think of the satisfaction you'd get from figuring out how to remove that much stone in that length of time (14

Continued

THE MAN OF MANY MEDIUMS

Left: **"I built this about 10 years ago for Ceil as a Christmas present, mainly because of her interest in Noah's arks. Now, whenever I need a present in a hurry, I rush out and get a pewter figure for the ark."**

Below: **"In this 4x7' scene—the Ascension of Christ—I carved the disciples on the ground in the foreground and have the figure of Christ rising above. The background for the work is an oil painting."**

years). And they did it without actually blowing the whole top off that mountain. Amazing!"

At home in the coastal marshlands

By almost every measure, Wayne Edwards literally has it all. There's the flexibility and the freedom from the 8 to 5 workaday world most of us find ourselves in. Then there's the quaint, low country-style house overlooking the meandering Okatie River. And he's been fortunate enough to have found enough commissions of varying types over the years to keep food on the table and to keep him interested as an artist.

Has all of this turned out as planned? "Not really," says Wayne. "I've just kind of gone where somebody asked me to go, and done what somebody asked me to do. Don't get me wrong; there's nothing wrong with making plans. But you have to be willing to change them when the time comes. Otherwise, you'll beat your head against the wall trying to make them come true.

"There is one thing I would like to do sometime in the future, though. And that's to build a treehouse for Ceil and me to actually live in. That would be great!"

Wayne's advice to would-be commercial artists

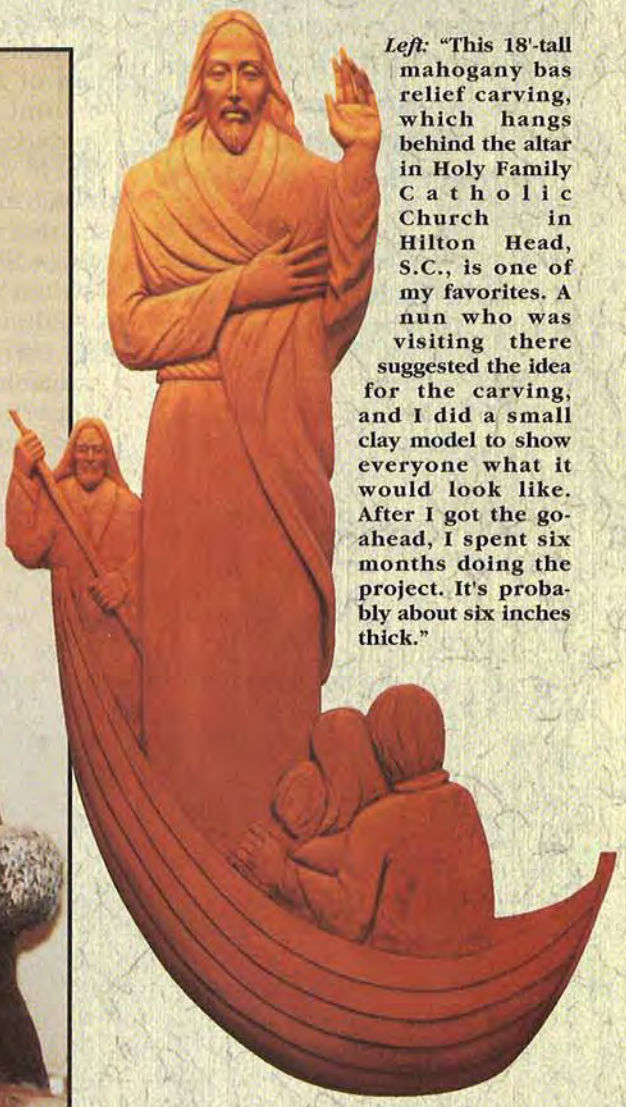
- **You'll need to be versatile** to make it financially. If someone wants a woodcarving done, you've got to be a woodcarver. If somebody wants a metal sculpture or a stain glass piece, you've got to go with that.

- **Being disciplined is a must.** You've got to be able to deliver the goods on time.

- **Having the freedom to make choices** you otherwise wouldn't be able to make is the best thing about being a commercial artist. I've had friends who say to me, "I don't know how you could sleep nights not knowing what exactly is coming next month or next year." And I say, "I don't know how you can sleep nights knowing exactly what is coming."

- **Prepare yourself for some dry spells between jobs.** And take advantage of the slow times by learning something new. It may come in handy sometime. Keeping yourself busy also keeps you from getting panicky about not having any work.

- **Don't count on being rich and famous.** It's mostly hard work.



Left: **"This 18'-tall mahogany bas relief carving, which hangs behind the altar in Holy Family Catholic Church in Hilton Head, S.C., is one of my favorites. A nun who was visiting there suggested the idea for the carving, and I did a small clay model to show everyone what it would look like. After I got the go-ahead, I spent six months doing the project. It's probably about six inches thick."**

Left: **"Being one-quarter Cherokee myself, I've always had an interest in Native Americans. This, combined with my fondness for working with clay, led me to create a series of 17 busts, most of which are historically accurate."**

Written by Larry Clayton Photographs: Bill Littell

AIR-FILTRATION SYSTEMS

Another Weapon in the Battle Against Workshop Dust

In the past year you've probably noticed a lot of advertising for a new category of products called air-filtration systems. So have we. To find out exactly what these products do, and which ones do it best, we ordered five popular models priced between $219 and $309. Here's what we discovered.

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How an air-filtration system can work for you

As you'll see in this article, there's nothing sophisticated about air-filtration systems. All of them consist of a sheet-metal box that you mount to any centrally located surface, such as a wall, ceiling, or shelf. Inside these metal boxes you'll find a "squirrel-cage" blower that moves air through two or three filters. There's also an on/off switch and power cord. That's it.

Although simple in construction, air-filtration systems perform a valuable service by removing the superfine wood dust that hangs for long periods of time in your shop's air. Although you cannot see some of this fine dust, it can do serious harm to your lungs. And, this dust eventually settles on shop surfaces, where it can easily be stirred up and put back into the air. It may even settle on the surfaces of your freshly finished projects.

Although our tests revealed that air-filtration systems do a good job of removing airborne dust, they are not a total solution to workshop dust. You also need a dust collector or shop vacuum for capturing the bulk of sawdust at the

How to select the right system for your needs

The air-filtration systems we tested advertise that they move between 350 and 500 cubic feet of air per minute (cfm). To find out for ourselves how much air each of the units moves under actual workshop conditions, we did our own cfm test. First, we subjected the units to the same amount of dust by mounting their inlet side to an opening in a plywood test chamber as shown *right*. Then, we created a cloud of dust in the chamber and allowed each air-filtration unit to run for a set amount of time. We repeated this procedure until the filters became dirty, but not totally clogged. Next, we shook the filters as clean as possible—just as you would do in your shop—and reinstalled them. We then took our cfm readings. As you can see in the chart at *the end of this article*, under the "air flow" heading, the systems ranged from 250 to 410 cfm under our testing conditions.

We built a plywood test chamber and used it to subject each air-filtration unit to equal amounts of dust.

Besides telling you how well the various units move air, these ratings also help you buy an air-filtration unit that's sized to meet your needs. To do this, determine the cubic feet of air in your shop, then divide that number by the cfm of the unit you intend to purchase. The resulting figure is the approximate number of minutes that it will take that unit to change your shop's air once.

For example, let's say you have a 20'×20' shop with an 8' ceiling. The number of cubic feet equals 20×20×8, or 3,200 cubic feet. Now, say you're planning to buy the Penn State

Like the other machines tested for this article, the JDS Air-Tech 2000 removes airborne dust from a workshop environment.

machine producing it. And, since it takes any air-filtration system some time to completely clear your shop's air, you should still wear an approved dust mask to protect yourself completely during and after you operate a dust-producing machine.

AC 460, which we tested as moving 410 cfm. Dividing 3,200 by 410 yields 7.8, the number of minutes for one air change.

Of course, the faster that such a machine cleans your shop's air, the better. We recommend that you only consider a machine, or combination of machines, that requires no more than 10 minutes to change your shop's air.

If none of the tested units appear large enough for your shop, you can buy larger versions from JDS, Penn State, Total Shop, or Trend-Lines. Or, for better air circulation in a big area, you can purchase more than one unit and position them at different spots in your shop. (You should locate an air-filtration system centrally, but as close as possible to where most fine dust is made, such as your sanding work area.)

What you need to know about filters

Except for the Hartville Tool unit, all of the tested machines have two filters on their inlet sides. The first filter, typically a 1"-thick version of pleated fabric or foam, traps most of the large dust particles. As shown *below,* a bag-type filter sits directly behind the first filter. It traps particles down to 1 micron in size. These filters cost about $30 to replace, and damage easily when you clean them, so the first filter serves mostly to keep the bag filter from clogging prematurely. The Hartville machine has a similar setup, but adds an inexpensive fiberglass filter (like the $1-2 versions for home furnaces) in front of its pleated filter (see *photo A on the next page*). We found little advantage to the three-filter setup.

Two of the tested units, made by JDS and Total Shop, have diffuser filters on their outlet sides, like

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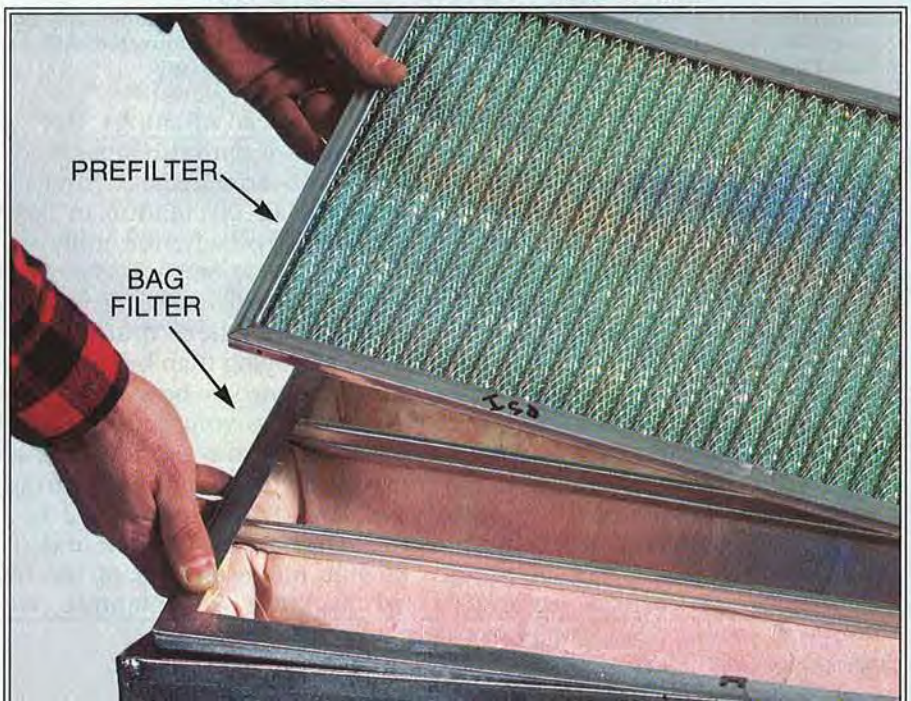
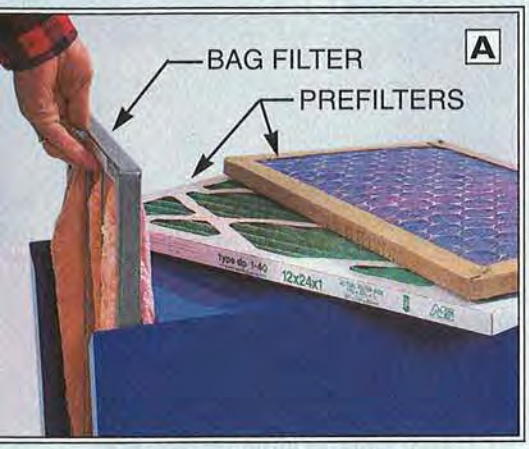
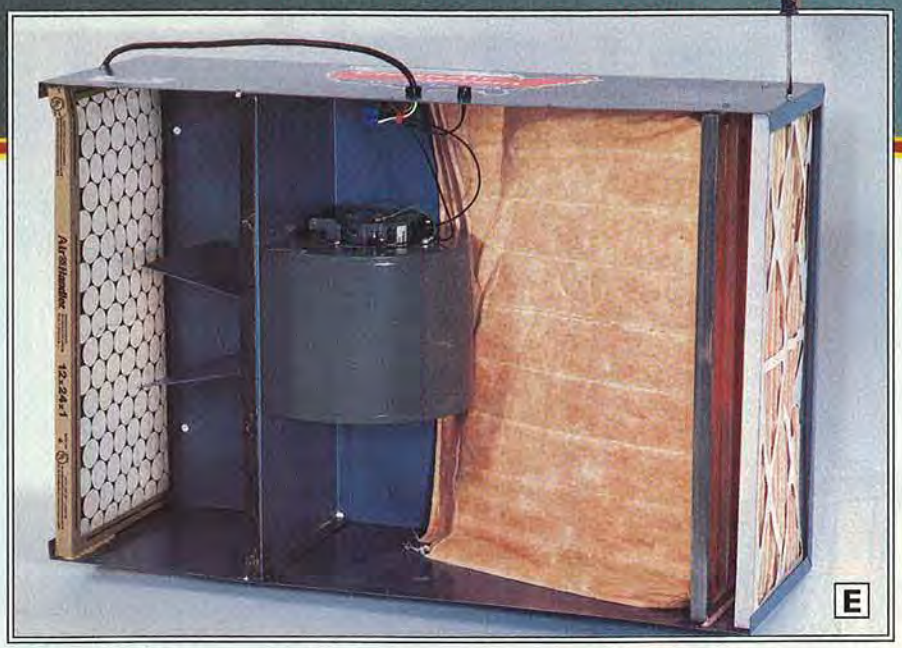
Thin prefilters capture the bulk of dust before it reaches the expensive bag filters. You can clean the Penn State prefilter shown here by spraying it with water.

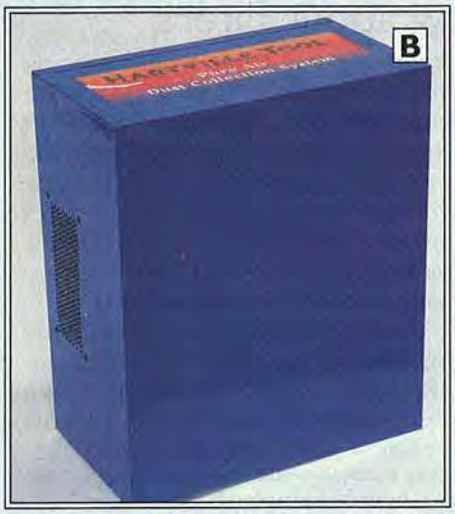




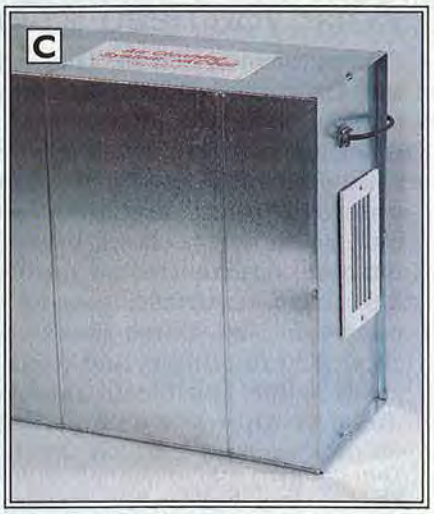
The Hartville Tool unit has one more prefilter than the other tested machines. We found it unnecessary.



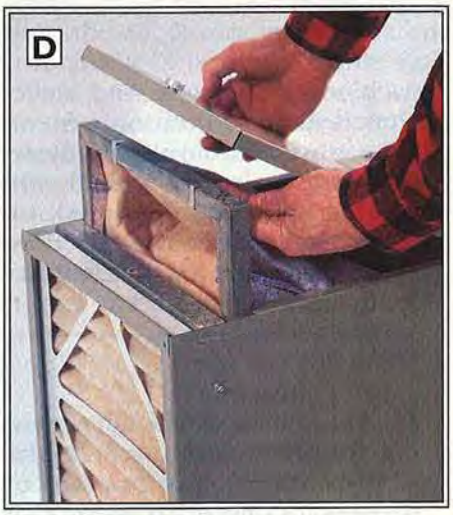
We removed the bottom panel of the Total Shop unit to show that both the prefilter and bag filter are held in place by screws and caulk.



The outlet on the air-filtration unit from Hartville Tool consists of a mesh of small holes in the metal cabinet.



Like the Trend-Lines model, the Penn State machine has a louvered outlet for directing the flow of air.



The well-engineered filter-retaining system on the JDS unit makes for well-sealed filters that change easily.

the one shown on the JDS unit on *the previous page*. These disperse the flow of air from the cabinet, and prevent strong air currents that might chill you or kick up settled dust. They also muffle the noise level of the machine slightly. As shown in *Photo B*, the Hartville unit has an outlet that consists of a mesh of small holes in the cabinet. This disperses the air somewhat, but not as effectively as a diffuser filter.

In place of a diffusing device, the Penn State and Trend-Lines units have louvered outlets as shown in *Photo C*. Air blows strongly through these openings, but you can direct it with the louvers. We found this arrangement handy for boosting air circulation in larger shops. Conversely, the units with diffuser filters seem better suited to smaller shops (under 3,000 cubic feet) where drafts can be more annoying than helpful.

Depending on how much time you spend in your shop, and how much dust you put into the air, you'll probably find yourself cleaning the filters every 2 to 12 months. You'll find it easy to change filters on four of the tested machines. For example, with the JDS unit, you simply open a door and remove the filters as shown in *Photo D*. However, the construction of the Total Shop unit complicates this task considerably. As shown in *Photo E*, with this machine you must first remove sheet-metal screws that fasten the filters to the cabinet sides. Then, you have to cut a bead of caulking that holds and seals each filter in place. After cleaning the filters, you need to recaulk them into place. This restores the seal, and in the case of the metal-framed bag filter, helps add rigidity to the cabinet.

Our recommendations

The JDS unit impressed us as being the best-engineered and most convenient-to-use machine in the test. The Penn State and Hartville Tool units rank high as well, for different reasons. The Penn State moved the most air, and like the Total Shop, has a bag filter with nearly twice as much surface area as the JDS and Hartville Tool models. Our only disappointment with the Penn State is that its filters do not seal tightly to the cabinet, allowing some air to bypass the filters altogether.

If you have an especially crowded shop, you will appreciate the smaller size of the Hartville Tool machine. We also liked its lighted switch. Unfortunately, it lagged far behind the others in cfm.

More points to consider

•Motors

Four of the tested units have the same Dayton blower and motor. It doesn't require lubrication, but the Fasco blower and motor found on the Hartville Tool model requires a few drops of oil from time to time. All of the motors were easy to access.

•Cabinets

We found all of the cabinets sufficiently solid, but the JDS was the most rack-free. The Hartville Tool, JDS, and Total Shop models are made of 18-gauge painted steel. The Penn State and Trend-lines units are made of galvanized sheet metal, like the ductwork in your home's heating/cooling system.

•Switches and cords

We found all of the switches somewhat lacking because none of them seem well-suited to what we suspect is the most common form of installation—on a ceiling. Mounted this way, many of us would need a ladder to reach the switch. For this reason, we replaced the cord-mounted rocker switch on the Penn State unit in IDEA SHOP® 2 with a pull-chain switch on the cabinet.

Another good option you may want to consider is plugging the unit into a switched outlet on your ceiling. If you feel you have the necessary electrical skills, you can wire the switch to a timer so the air-filtration system stays on for a set amount of time, say 10 minutes, after you leave the shop.

Only the Hartville Tool model comes with a lighted switch. This proved handy as a visual reminder that the unit was running at times when the noise in our shop drowned out the blower noise.

Four of the units have 80"-or-longer power cords. The cord on the Total Shop machine was markedly shorter at only 32".

Thinking of building your own?

If you would like to design your own air-filtration system, you can purchase blowers and filters like those shown in this article. Just call a commercial-supply house such as W.W. Grainger (it has branches nationwide).

In the October 1992 issue of *WOOD®* magazine, we show how to build a mobile air-filtration cabinet that moves over 1,000 cfm of air and doubles as a tablesaw outfeed table. For a copy of this article, send $2 and a stamped, self-addressed envelope to:

Air-filtration cabinet article
WOOD magazine
1912 Grand Ave.
Des Moines, IA 50309-3379

FRESH FACTS ABOUT AIR-FILTRATION SYSTEMS

MANUFACTURER	MODEL	AIR FLOW (1) (CFM)	FILTERS (2) NUMBER	FIRST-FILTER MATERIAL (3)	BAG FILTER AREA (SQUARE INCHES)	DIFFUSER FILTER (YES, NO)	SEAL OF FILTERS TO CABINET	EASE OF CHANGING	EASE OF CLEANING	PERFORMANCE (4) OVERALL	PERFORMANCE (4) VALUE	OPTIONS (5)	MOTOR LUBRICATION NECESSARY (YES, NO)	MOUNTING OPTIONS (6)	CORD LENGTH (INCHES)	SWITCH TYPE (7)	CABINET DIMENSIONS (INCHES) (HEIGHTxWIDTHxLENGTH)	WEIGHT (POUNDS)	WARRANTY (YEARS)	PRICE FROM MANUFACTURER	SHIPPING CHARGE	PHONE NUMBER	COMMENTS
HARTVILLE TOOL	PURE AIR	250	3	FG*	1,250	N	E	G	E	8.5	8.5	--	Y	C,D,S	80	LR	12x24x20	30	LIFE-TIME	$249	$9.50	800/345-2396	The most compact unit, and the only one with a lighted switch and built-in circuit breaker.
JDS	AIR-TECH 2000	365	2	PLF	1,300	Y	E	E	E	9.5	9.5	C,E	N	C,D,S	84	CMR	12x24x28	40	1	259	18.00	800/382-2637	Solid, rack-free cabinet. Well designed, but we wish its bag filter had more surface area.
PENN STATE	AC 460	410	2	FO	2,400	N	F	E	G	8.5	8.5	--	N	C,D,S	90	CMR	12x24x30	40	1	259	12.00	800/377-7297	Filters change easily, but do not seal well to cabinet. Has directional louvers on outlet.
TOTAL SHOP	90177	325	2	PLF	2,400	Y	E	P	P	7	6	--	N	C,D,S,W	32	R	13x25x40	40	1	309	20.00	800/845-9356	Changing and cleaning filters is a major undertaking because they are caulked to cabinet.
TREND-LINES	AC450	400	2	PM	1,530	N	P	F	G	6	6	--	N	S	120	CMR	12x12x30	35	30 DAYS	219	9.50	800/767-9999	Filters do not seal well. Sharp exposed metal edges were a nuisance.

NOTES:

1. According to a *WOOD®* magazine test conducted by an independent, certified professional engineer. Air flow measured in cubic feet of air moved per minute (cfm). Prior to test, all filter systems were equally subjected to wood dust, and then shaken clean to simulate actual workshop use.
2. E Excellent; G Good; F Fair; P Poor
3. (FG*) Fiberglass, furnace-type filter, backed by a pleated-fabric filter. (FO) Foam, washable (PLF) Pleated-fabric (PM) Polyester mesh
4. Rated on a 1 to 10 scale with 10 being the highest possible score.
5. (C) Activated charcoal (E) Electrostatic filter
6. (C) Ceiling mounting with chain (D) Direct ceiling mounting (S) Shelf or bench mounting (W) Wall mounting
7. (CMR) Cord-mounted rocker (LR) Lighted rocker (R) Rotary
8. Prices current at time of article's production.

Written by: Bill Krier Photographs: John Hetherington Illustration: Brian Jensen

OIL-FINISH

How to safely handle materials

Print this article

Last November, the television program Dateline NBC carried an alarming report on spontaneous-combustion hazards related to linseed oil—a chief ingredient in several wipe-on oil finishes. Graphic footage of burned homes and the people who perished in them made for some emotion-provoking programming. But, the show seemed biased against linseed-oil-based finishes. After all, thousands, if not millions, of woodworkers have used linseed oil without problems for a great many years. To get the full story here, I investigated this controversy myself. Here's what I discovered.

Bill Krier

Bill Krier
Assistant Managing Editor

How drying oils can spontaneously combust

There's no way around it. When you finish projects with so-called drying oils, you generate a number of rags soaked in the material by either applying or wiping up excess oil. (We'll tell you what specific products are considered drying oils in the next section.) As the finishes in these rags dry, they absorb oxygen and release heat. Unless this heat has a way to escape, it can build up to the point that a fire starts. Most incidents of spontaneous combustion occur when someone disposes of oil-soaked rags by wadding them up and tossing them in a trash can. To find out how to correctly dry the rags, see the last section of this article, "Here's the proper way to dispose of oily waste."

Drying oils you should know about

For expert advice on this subject, I spoke with Roger Petty, director of manufacturing for Sunnyside, a producer of finishing oils and solvents. Petty told me that "linseed oil is just one of several drying oils that can create a spontaneous combustion problem. Other drying oils include walnut oil and tung oil. Sunnyside products such as acetone, mineral spirits, and lacquer thinner pose no spontaneous combustion hazard, but their vapors are flammable."

On today's market you'll also find a number of so-called "Danish" oils that are typically a blend of linseed oil and various solvents and resins. These, too, are considered drying oils.

So, what about stains, polyurethanes, and other finishing products that don't have exact ingredients listed on their labels? If they contain drying oils, they should have a labeled warning about spontaneous combustion.

"The best advice you can give your readers is to 'read those warning labels,'" Howard Mead, a spokesman with L&F Products, told me. (At the time, L&F Products owned Minwax, the parent company of Watco, a popular, linseed-oil-based finish. Minwax now has new owners who ceased deliveries of Watco last December. The Watco brand was then acquired by The Flecto Company last February.).

As Mead explained to me, you need to carefully examine container labels because the word "oil" may not even appear in the name of a product that poses a possibility of spontaneous combustion. And, formulations for identically titled products can change from state to state. For example, "brushes or rags soaked in Minwax Polyurethane, Polyshades (a combination polyurethane/stain product), and national brands of Minwax Wood Finish (oil-based stain) pose no spontaneous-combustion hazard and can go into the trash," according to Mead. "But, in New York, New Jersey, and California, Minwax Wood Finish products have combustion warnings because the formulas had to be changed to comply with clean-air regulations for those states."

Here's the proper way to dispose of oily waste

All of the drying oil-based finishes that we've come across have similar directions for the proper disposal of oil-soaked rags and brushes. These directions tell you to place oil-soaked waste into a sealed, water-filled metal container immediately after use. Then, put the container in the garbage.

Since I've always hung oily rags to dry before tossing them out, I wondered if I had been doing it the wrong way. But, if I follow the suggested disposal procedure, where would I find enough paint cans to do it that way? And, it seems environmentally unfriendly to dump a container of oil-tainted water into the trash.

To find out what my fellow woodworkers do with their linseed-oil soaked rags, I did an infor-

COMMON SENSE
that could spontaneously catch fire

mal poll of *WOOD* magazine staff members (we go through a lot of oil finishes in our on-site shop). Design editor Jim Downing lays the rags out flat on his concrete driveway to dry; Assistant Design Editor Jan Svec hangs the rags until they dry stiff. Chuck Hedlund, our Project Builder, follows the same procedure as Jan, and added, "The key to drying the rags properly is that you should never fold the rags over—all surfaces should be equally exposed to air so that heat can dissipate evenly." With oil-soaked brushes, Chuck cleans them in a solvent such as mineral spirits, then hangs them to dry in a ventilated area away from heat sources.

IMPORTANT FACTS ABOUT DRYING OILS

- Drying oils include linseed oil, walnut oil, tung oil, and so-called "Danish" oils.
- These oils produce heat as they dry and may spontaneously combust if rags soaked in them are wadded up or overlapped.
- A variety of wood-finishing products, including some oil-based stains, may contain one or more drying oils.
- The presence of these oils may not be noted on a product container.

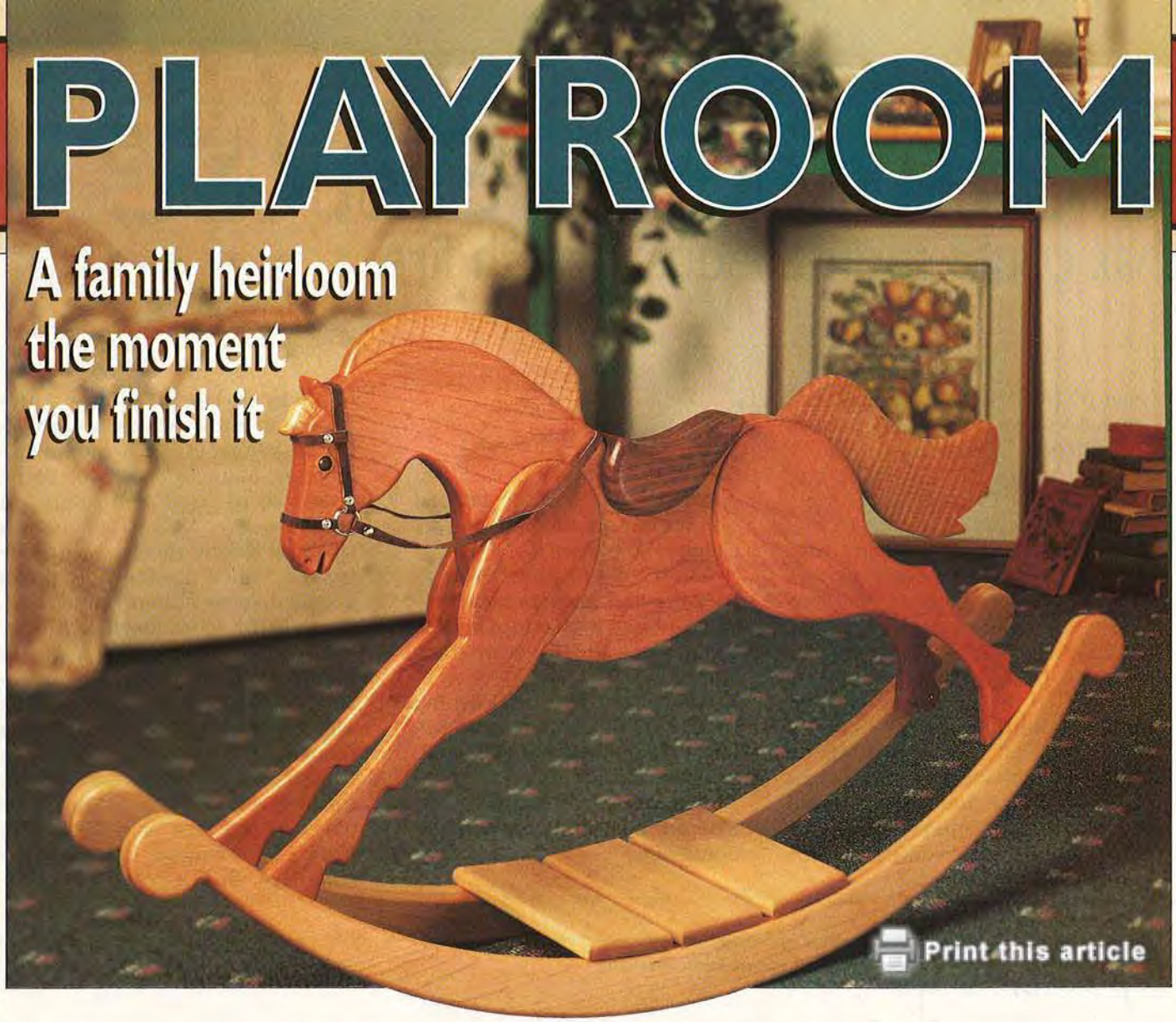
So why do labels describe a procedure that few people seem willing to follow? At least one manufacturer, Sunnyside's Roger Petty, was able to shed some light on the subject. "What we put on labels is largely dictated to us by lawyers. Since placing the rags in a sealed, water-filled, metal container is the most absolutely, positively safe method, it's also the method that's most legally defensible. You can safely handle the rags by hanging them, or placing them on concrete, but this isn't as foolproof. A consumer might think he's doing it right, but if he overlaps the rags or places them near a heat source, the hazard is still there."

Products that contain drying oils come in many brands and titles, so always check for spontaneous-combustion warning labels before applying a finish.

Photographs: Hetherington Photography

PLAYROOM

A family heirloom the moment you finish it



Little buckaroos will ride into the night, or at least until bedtime, on this soon-to-be classic. Its stylish lines and straightforward construction make for a sure winner under the tree this holiday season. You'd better make templates, though, because you'll have plenty more orders after you let this one out of the barn.

Start with the horse body

1 Cut two pieces of ¾"-thick cherry to 11¼×24". With the edges and ends flush, glue and clamp the pieces face-to-face to form a 1½"-thick body blank (A). (If you don't have 11¼"-wide stock, edge-join narrower stock and sand smooth before gluing face-to-face. Or, see our source of hardwood stock listed in the Buying Guide at the end of the article.)

2 Transfer the full-sized body pattern, hole centerpoints, and dowel alignment marks from the *WOOD PATTERNS*™ insert in the center of the magazine to the body blank. (We cut the paper pattern to shape, and used spray adhesive to adhere it to the wooden body blank.) Bandsaw the body to shape, and sand the cut edges smooth.

3 Drill four 7/64" pilot holes completely through the body (A) for aligning and attaching the legs later. Switch bits, and drill 1/16" guide holes (you'll drill them larger later) for the nostril, eye, and bridle. Backing the stock to prevent chip-out, drill a ½" hole for the eyeball and a ¾" hole for the handle. (If you plan on using your horse strictly for decoration, we recommend not adding the turned maple handle.)

4 Mount a ¼" core-box router bit or ¼" twist-drill bit into your drill press, and drill a ⅛"-deep depression centered over the 1/16" guide holes for each nostril. (We clamped the body to our wooden drill-press table to keep it steady when drilling the depressions. A core-box bit leaves a slightly more pleasing-looking depression than a drill bit.)

5 Rout ¼" round-overs on the 1½"-thick body where shown on the full-sized body pattern and the photo *above*.

PALOMINO

OK, let's form the tail, mane, and forelock

1 Cut the tail (B), mane (C), and forelock (D) blanks to the sizes listed in the Bill of Materials and shown on the Cutting Diagram.

2 Transfer the full-sized patterns from the insert to each blank. For ease in routing the round-overs on the forelock, we've located the pattern on one end of the blank. This extra length acts as a handle for safety when routing. Cut the pieces to shape, except for the portion of the forelock marked with a dashed line. You'll cut this edge to shape after routing.

3 Rout ¼" round-overs on each piece where shown on the Exploded View drawing. There are no round-overs on the edges that mate with the body (A).

4 Cut the forelock to final shape, cutting along the dashed line.

5 Check the mating edges of the tail, mane, and forelock against the body of the horse. Sand the mating edges of the smaller pieces if necessary for a flush fit. Set the pieces aside; you'll add them later.

6 Aligning a doweling jig with the alignment marks, drill a pair of ⅜" holes 1 1/16" deep in the body and a mating pair in the tail. See the Dowel detail accompanying the Exploded View drawing for reference. Set the tail aside.

The wide, laminated saddle comes next

1 Cut the saddle-side blanks (E) to size, and transfer the pattern to one of the blanks. Using double-faced tape, adhere the two saddle-side blanks together face-to-face, with the edges and ends flush. Bandsaw the saddle sides to shape. Sand the edges of the taped-together sides flush, pry the pieces apart, and remove the tape.

2 To form the saddle center, cut two saddle-center blanks (F) to the size listed in the Bill of Materials. For a proper fit later, make sure the thickness of the saddle center is the same as that of the thickness of the horse's body. Glue and clamp the two blanks face-to-face with the edges and ends flush. Transfer the pattern, and cut the piece to shape.

3 Glue and clamp the saddle center (F) between the sides (E). Remove any excess glue before it dries. Sand the top edge of the laminated saddle flush.

4 Rout ½" round-overs along the outside edges of the saddle sides where shown on the Exploded View drawing.

Add the legs for a lengthy gait

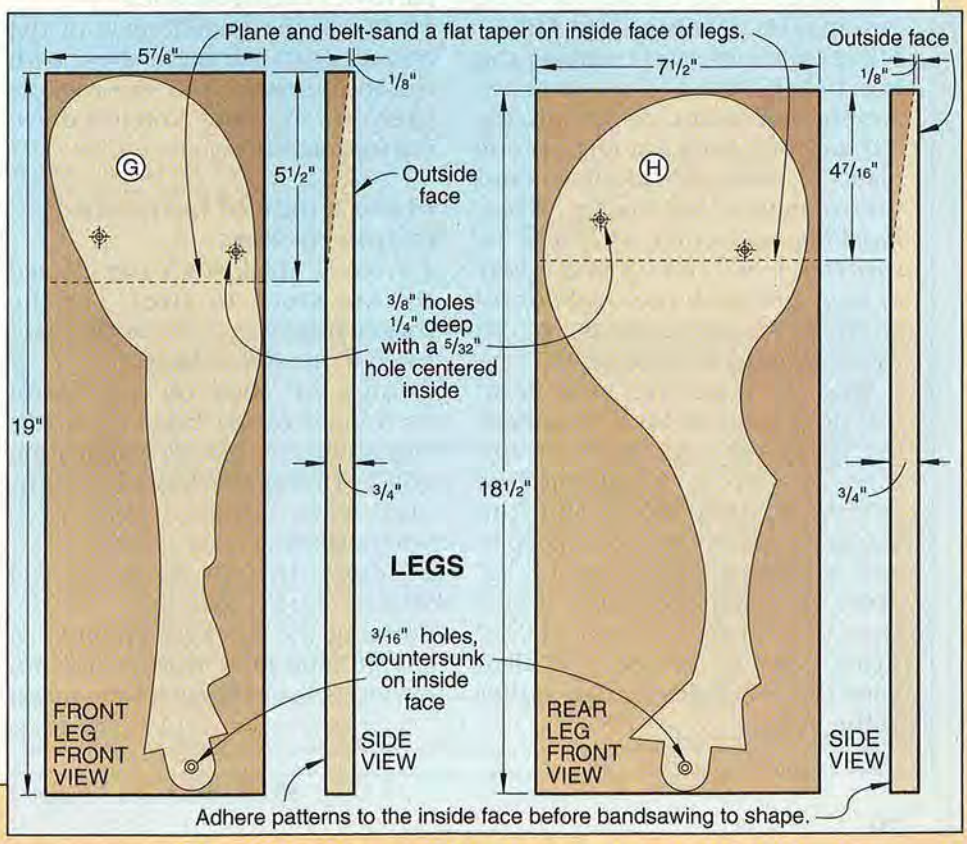
1 Cut the front-leg blanks (G) and rear-leg blanks (H) to size.

2 Using the Legs drawing *below* for reference, transfer the taper lines to the inside surface, adjacent edges, and top end of all four leg blanks. The taper on the top end of each leg allows the legs to splay out from the body, making for a wider and more stable rocker base. Keep in mind that the front legs as well as the back are mirror images of each other.

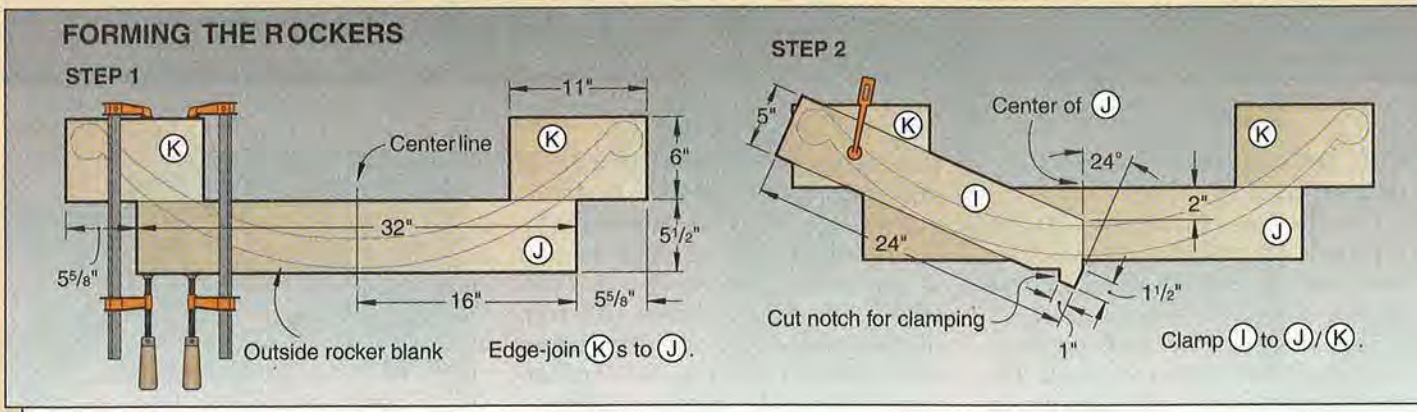
Mark the taper lines on each leg blank. Hand-plane and belt-sand to the lines to angle the inside surface of each leg.

3 Hand-plane and then belt-sand to the marked taper lines to form a taper on each leg as shown in the photo *above*. To remove the

Continued



PLAYROOM PALOMINO



wood quickly after planing, use a 60-grit sanding belt. To further flatten the tapered areas, adhere a full-sheet of 100-grit sandpaper to a piece of ¾"-thick plywood. Clamp the plywood to your workbench top, and rub the tapered area of each leg against the sandpaper, being careful to keep the taper flat against the sandpaper. Use a straightedge to check that the tapered surface is flat.

4 Adhere the full-sized paper patterns to the *inside surface* of one front-leg blank and one rear leg blank, aligning the dashed edge-of-the-taper line on the pattern with that on each leg blank. You'll be forming the right-hand legs first.

5 Bandsaw and sand to shape the leg blanks with the patterns attached. Use the one front leg (G) and one back leg (H) as templates to mark their outlines onto the remaining leg blanks. *When marking the second set of legs, be sure that you'll end up with a pair of legs, not with two right-hand front or rear legs.* Bandsaw the two remaining legs to shape.

6 With the edges and ends flush, use double-faced tape to adhere the two front legs together and then the two back legs *outside face to outside face*. Using the marked centerpoints on the pattern as guides, drill a pair of 5/32" holes through the tapered surfaces of both sets of legs. The 5/32" shank holes in the legs will align with the 7/64" holes drilled earlier in the body.

7 Drill and countersink a 3/16" hole at the hoof end of each leg for attaching the legs to the rockers later. Pry the legs apart, and remove the paper patterns.

8 Drill a 3/8" hole ¼" deep centered over the two 5/32" holes on the *outside surface* of each leg. (We clamped each leg to our wooden drill-press table to accurately center the 3/8" Forstner bit over the small hole and to keep the leg from moving when drilling.)

9 Rout ¼" round-overs on each leg where shown on the Exploded View and full-sized patterns. Hand-sand round-overs on the top narrower end of each leg.

10 Chisel the outside face of the hooves that will mate flush with the inside surface of the rockers later. See the Hoof Notches drawing for reference.

Make a pair of laminated maple rockers

1 From 5/8"-thick stock (we planed thicker stock to size), cut the rocker blanks (I, J, K) to the sizes listed in the Bill of Materials.

2 Cut a 24° angle on one end of each inner rocker blank (I) where shown on the Rocker Lamination and Forming the Rockers drawings. Next, cut a notch in each where shown.

3 Edge-join two Ks to each J where shown on Step 1 of the Forming the Rockers drawing. A simple glue joint will do. Do not use dowels or biscuits; they might

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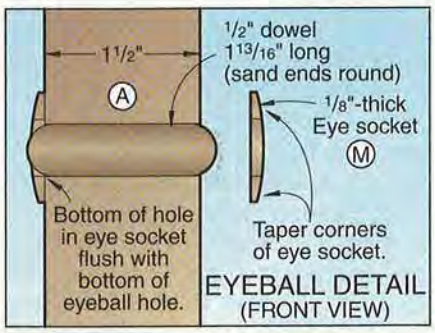
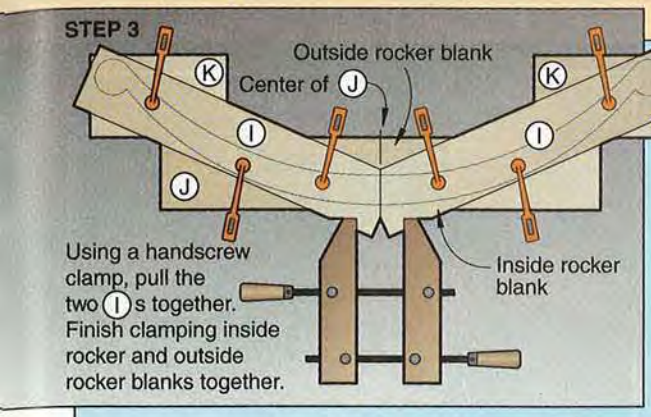


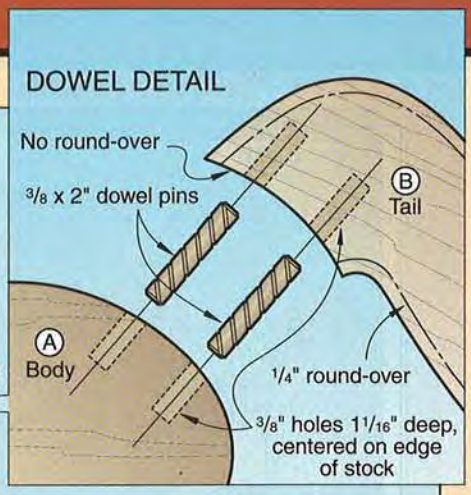
Bill of Materials

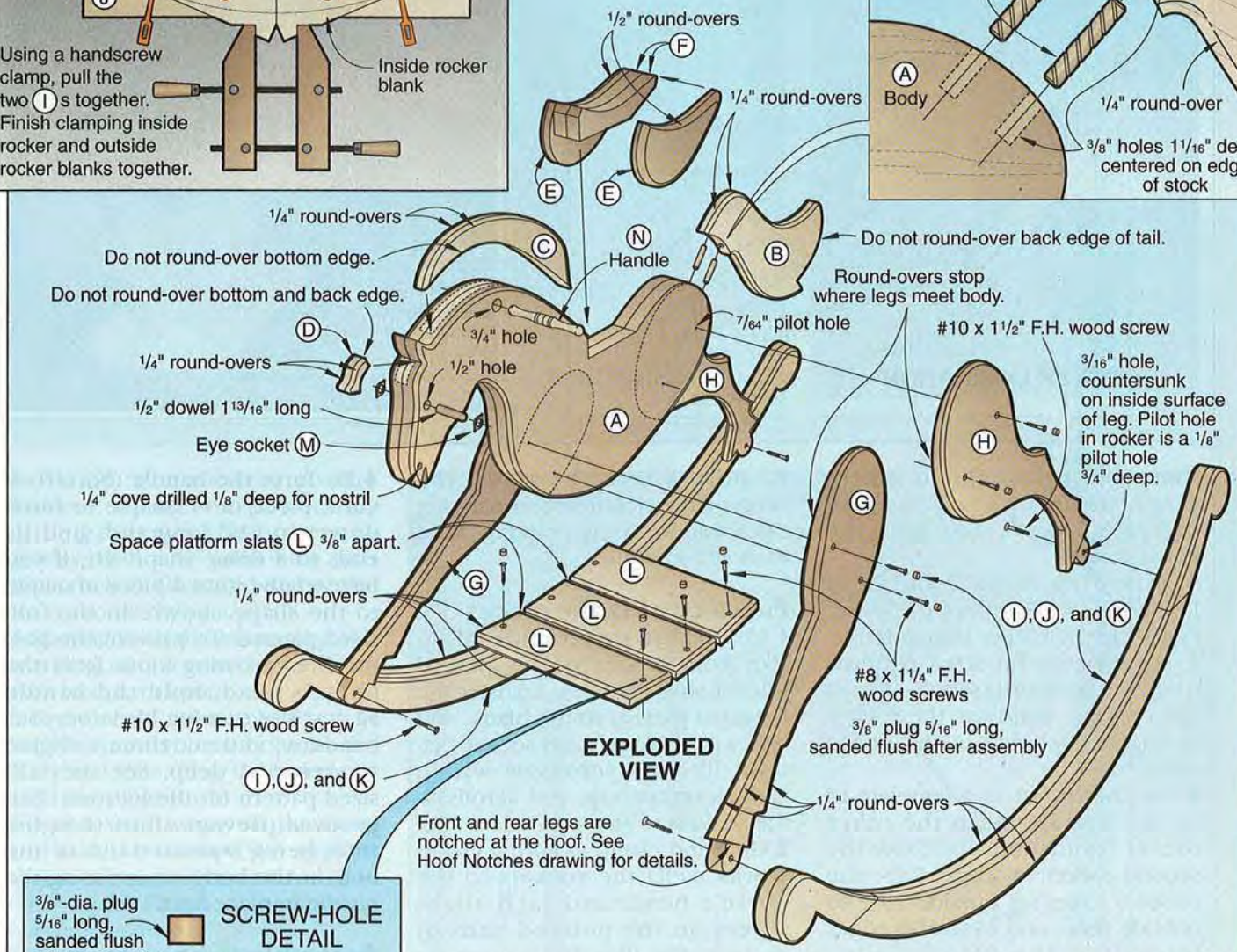
Part	Finished Size T	W	L	Matl.	Qty.
A body blank	1½"	11¼"	24"	LC	1
B tail blank	¾"	6"	12"	M	1
C mane blank	¾"	3½"	10½"	M	1
D forelock blank	¾"	1"	6"	M	1
E saddle side blanks	¾"	3½"	7"	W	2
F saddle center blank	1½"	1⅝"	6"	LW	1
G front leg blanks	¾"	5⅞"	19"	C	2
H rear leg blanks	¾"	7½"	18½"	C	2
I rocker inner	⅝"	5"	24"	M	4
J rocker outside center	⅝"	5½"	32"	M	2
K rocker outside ends	⅝"	6"	11"	M	4
L platform slats	¾"	3½"	10½"	M	3
M eye socket blank	⅛"	1"	3"	C	1
N handle	¾"-diam.		7½"	M	1

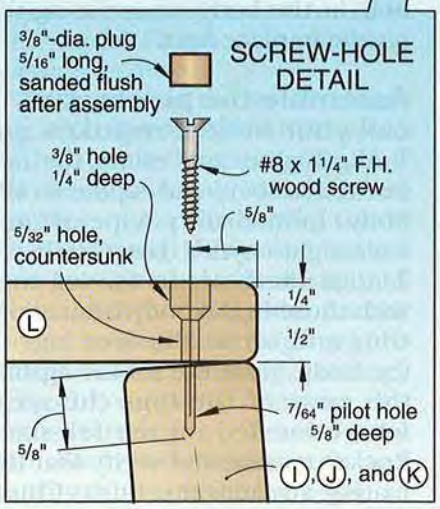
Materials Key: LC–laminated cherry, M–maple, W–walnut, LW–laminated walnut, C–cherry.

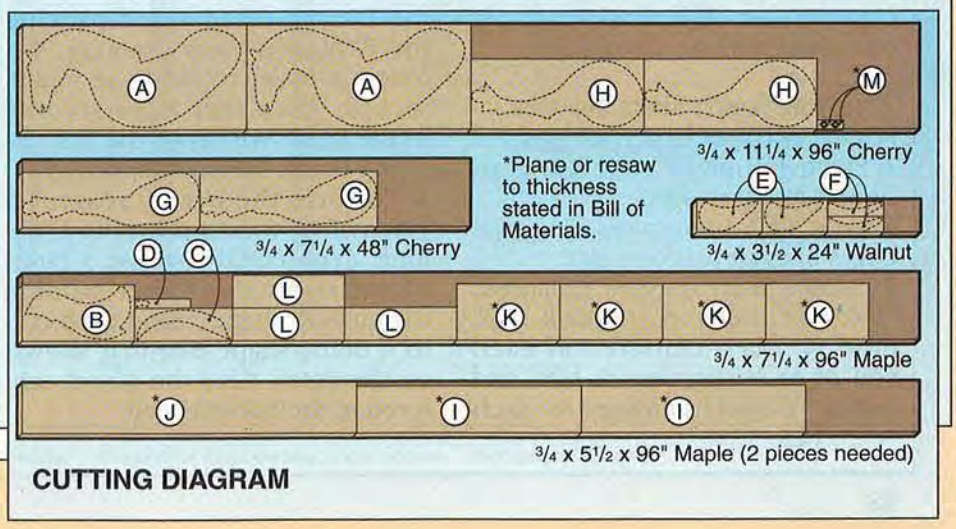
Supplies: #8x1¼" flathead wood screws, #10x1½" flathead wood screws, ⅜" dowel pins 2" long, ½" walnut dowel 1 13/16" long, 61" of ⅜"-wide leather strap, two 1"-diameter rings, #6x½" oval-head wood screws with #6 finish (countersunk) washers, ¾" dowel for handle (N), clear finish.


STEP 3
Outside rocker blank
Center of J
K
I
J
Using a handscrew clamp, pull the two I s together. Finish clamping inside rocker and outside rocker blanks together.
Inside rocker blank

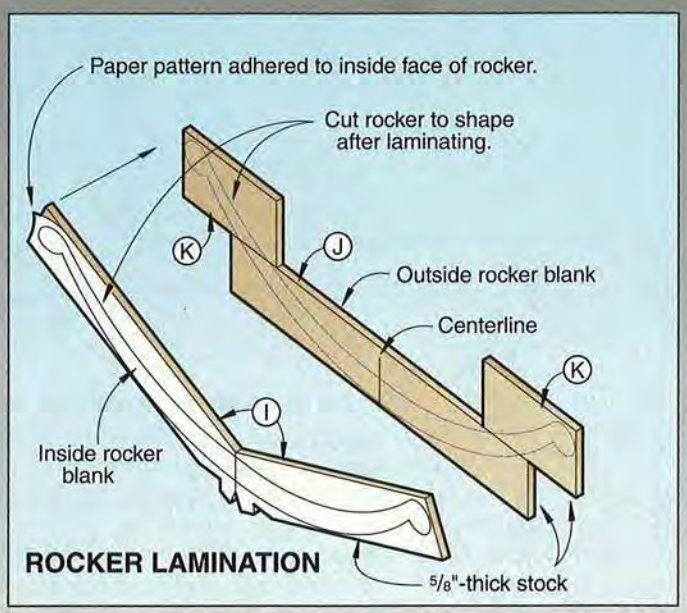

DOWEL DETAIL
No round-over
3/8 x 2" dowel pins
B
Tail
A
Body
1/4" round-over
3/8" holes 1 1/16" deep, centered on edge of stock

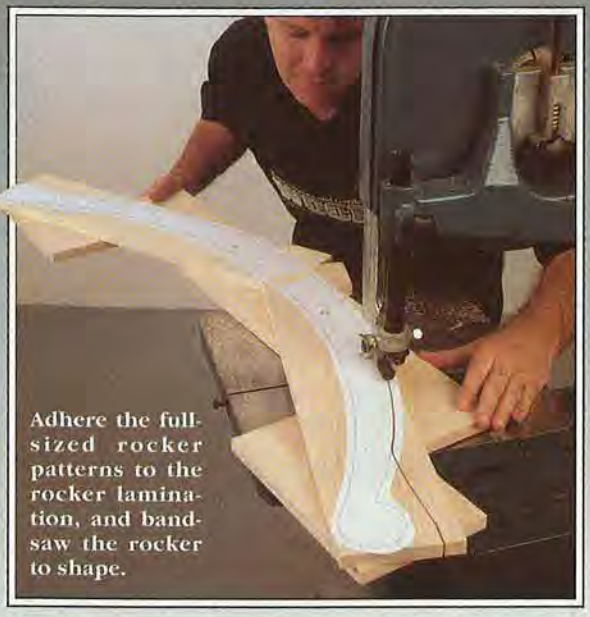

1/2" round-overs
F
1/4" round-overs
E
E
1/4" round-overs
C
Do not round-over bottom edge.
Do not round-over bottom and back edge.
N
Handle
B
Do not round-over back edge of tail.
Round-overs stop where legs meet body.
D
3/4" hole
7/64" pilot hole
#10 x 1 1/2" F.H. wood screw
1/4" round-overs
1/2" hole
H
3/16" hole, countersunk on inside surface of leg. Pilot hole in rocker is a 1/8" pilot hole 3/4" deep.
1/2" dowel 1 13/16" long
A
Eye socket M
1/4" cove drilled 1/8" deep for nostril
G
Space platform slats L 3/8" apart.
L
1/4" round-overs
G
L
L
I, J, and K
#8 x 1 1/4" F.H. wood screws
3/8" plug 5/16" long, sanded flush after assembly
#10 x 1 1/2" F.H. wood screw
I, J, and K
EXPLODED VIEW
1/4" round-overs
Front and rear legs are notched at the hoof. See Hoof Notches drawing for details.


3/8"-dia. plug 5/16" long, sanded flush after assembly
SCREW-HOLE DETAIL
3/8" hole 1/4" deep
#8 x 1 1/4" F.H. wood screw
5/8"
5/32" hole, countersunk
1/4"
L
1/2"
7/64" pilot hole 5/8" deep
5/8"
I, J, and K


A
A
H
H
M
3/4 x 11 1/4 x 96" Cherry
*Plane or resaw to thickness stated in Bill of Materials.
G
G
3/4 x 7 1/4 x 48" Cherry
E
F
3/4 x 3 1/2 x 24" Walnut
D
C
L
L
B
L
K
K
K
K
3/4 x 7 1/4 x 96" Maple
J
I
I
3/4 x 5 1/2 x 96" Maple (2 pieces needed)
CUTTING DIAGRAM

PLAYROOM PALOMINO





show after cutting the rockers to shape. Remove the excess glue before it dries. Later, sand the joints smooth.

4 Following Steps 2 and 3 on Forming the Rockers drawing, complete the rocker laminations.

5 Transfer the full-sized patterns from the pattern insert to one of the rockers. Bandsaw the rocker to shape as shown in the photo *above right.*

6 Use the rocker as a template to mark its shape onto the other rocker lamination. Bandsaw the second rocker to shape. Tape the rockers together outside face to outside face, and sand the edges flush. Pry the pieces apart, remove the tape, and rout ¼" round-overs along all edges.

The platform slats tie the rockers together nicely

1 From ¾" maple, cut the platform slats (L) to size.

2 Rout ¼" round-overs along all edges of each platform slat.

3 Using a fence on your drill-press table, set the stop and drill a ⅜" hole ¼" deep centered at each end of each slat. Switch bits, and drill a 5/32" hole centered in each ⅜" hole where shown on the Screw-Hole detail accompanying the Exploded View drawing. Sand each slat smooth.

Finish cutting the pieces

1 Cut the eye socket blank (M) to size from ⅛" cherry (we planed thicker stock to size). Transfer the full-sized pattern to the blank, and drill a ½" hole in each socket pattern. Fit your scrollsaw with a zero-clearance top, and scrollsaw the sockets to shape.

2 Glue and clamp (a spring clamp works well) the sockets to the horse's head, and sand slight tapers on the pointed ends of each socket like that shown on the Eyeball detail accompanying the Exploded View drawing. We found it easier to sand the fragile sockets when they were secured to the head. We broke the first set trying to sand them unattached.

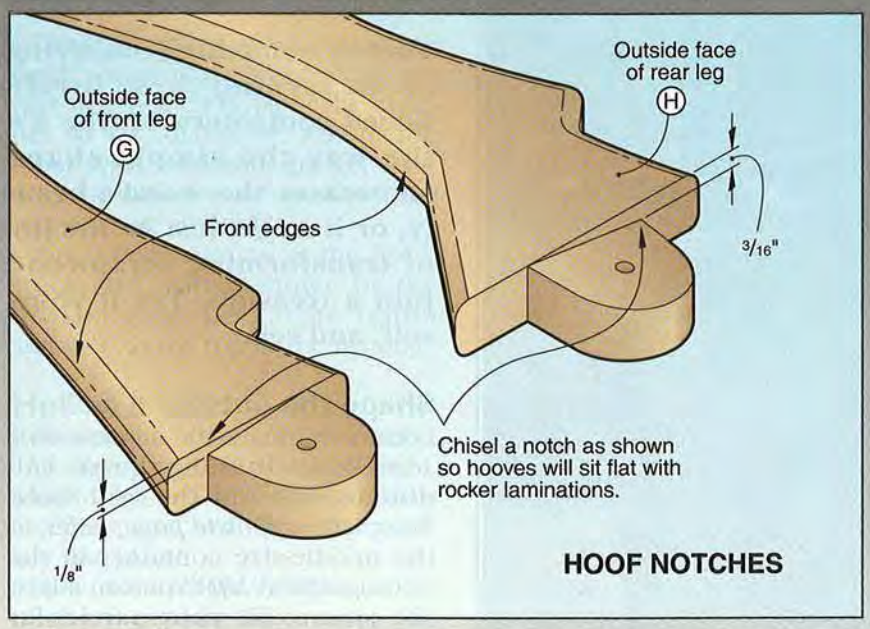
3 To form the eyes, crosscut a piece of ½" walnut dowel to 1 13/16" long. (You could also use a birch dowel and stain it after sanding the ends to shape.) Sand each end to a dome shape like that shown on the detail. Glue the dowel centered in the horse's head.

4 To form the handle (N), crosscut a piece of ¾" maple or birch dowel to 7½" long and sand its ends to a dome shape. Or, if you have a lathe, turn a piece of maple to the shape shown on the full-sized pattern. To prevent the handle from twisting loose from the horse's head, hold the handle against the running blade on your bandsaw, and cut three 1/16" glue grooves 1/16" deep. See the full-sized pattern for the location. The grooves prevent all of the glue from being squeezed out of the hole in the body when fitting the handle in place later.

Assemble the pieces, and call your little cowpokes

1 Align, glue, and clamp the tail, mane, forelock, and saddle to the body. Immediately wipe off any excess glue with a damp cloth.

2 Align the holes in the leg tops with those in the body lamination. Glue and screw the four legs to the body. Hold the rocker against the ends of the legs (hooves) where located on the full-sized Rocker pattern and verify that the mating surfaces are flush. Chisel hooves more if necessary.



HOOF NOTCHES

Buying Guide

Hardwood and leather kit. All the individual pieces shown on the Cutting Diagram cut slightly oversized in length and width from the thicknesses listed in the Bill of Materials from the type of wood noted. Plus, 61" of ⅜"-wide leather for bridle, ⅛" leather punch, 8 rivets and setter, two 1"-diameter rings, eight ovalhead screws and finish washers. W83C, $169.95 ppd. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Or call 800/524-4184 to order.

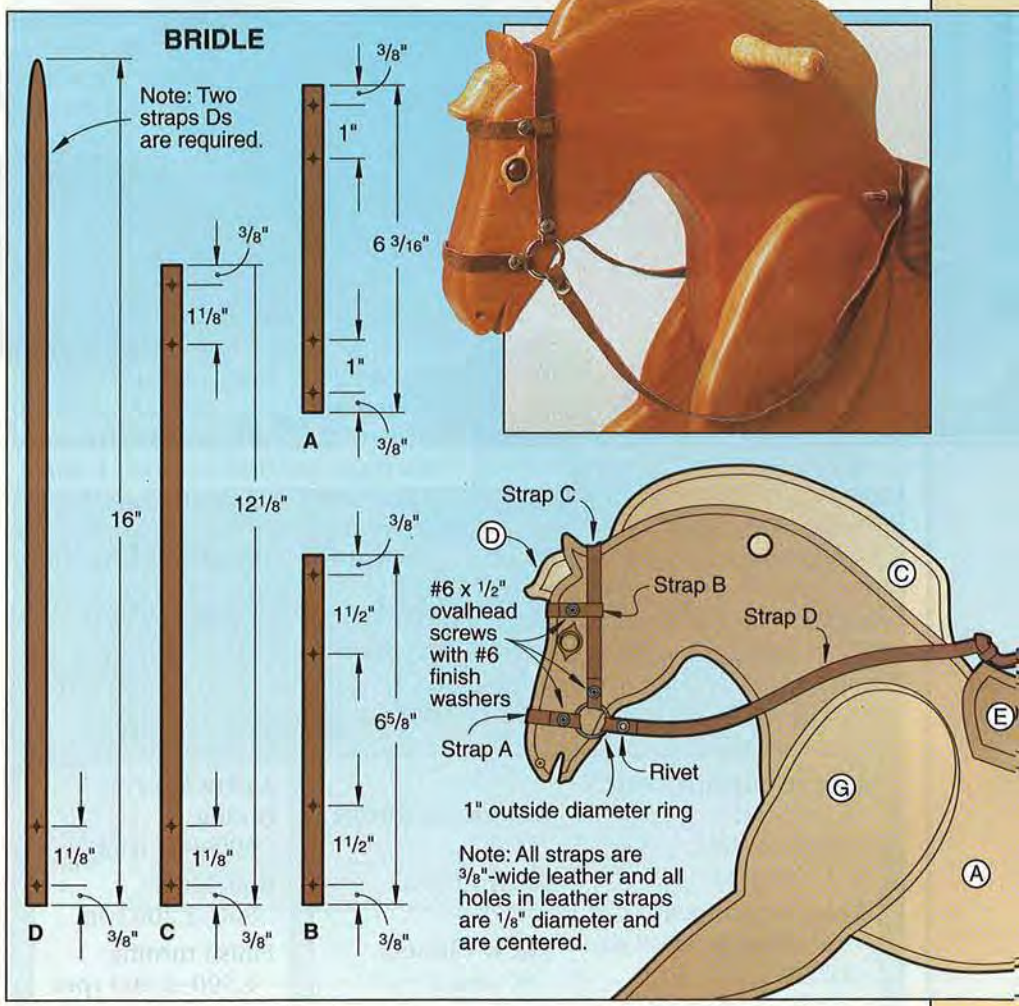
3 Clamp the rockers to the hooves. Using the previously drilled holes in the hooves as guides, drill a ⅛" pilot hole into each rocker. Glue and screw the rocker to the hooves.

4 Starting with the center slat and working out, screw the platform slats to the rockers.

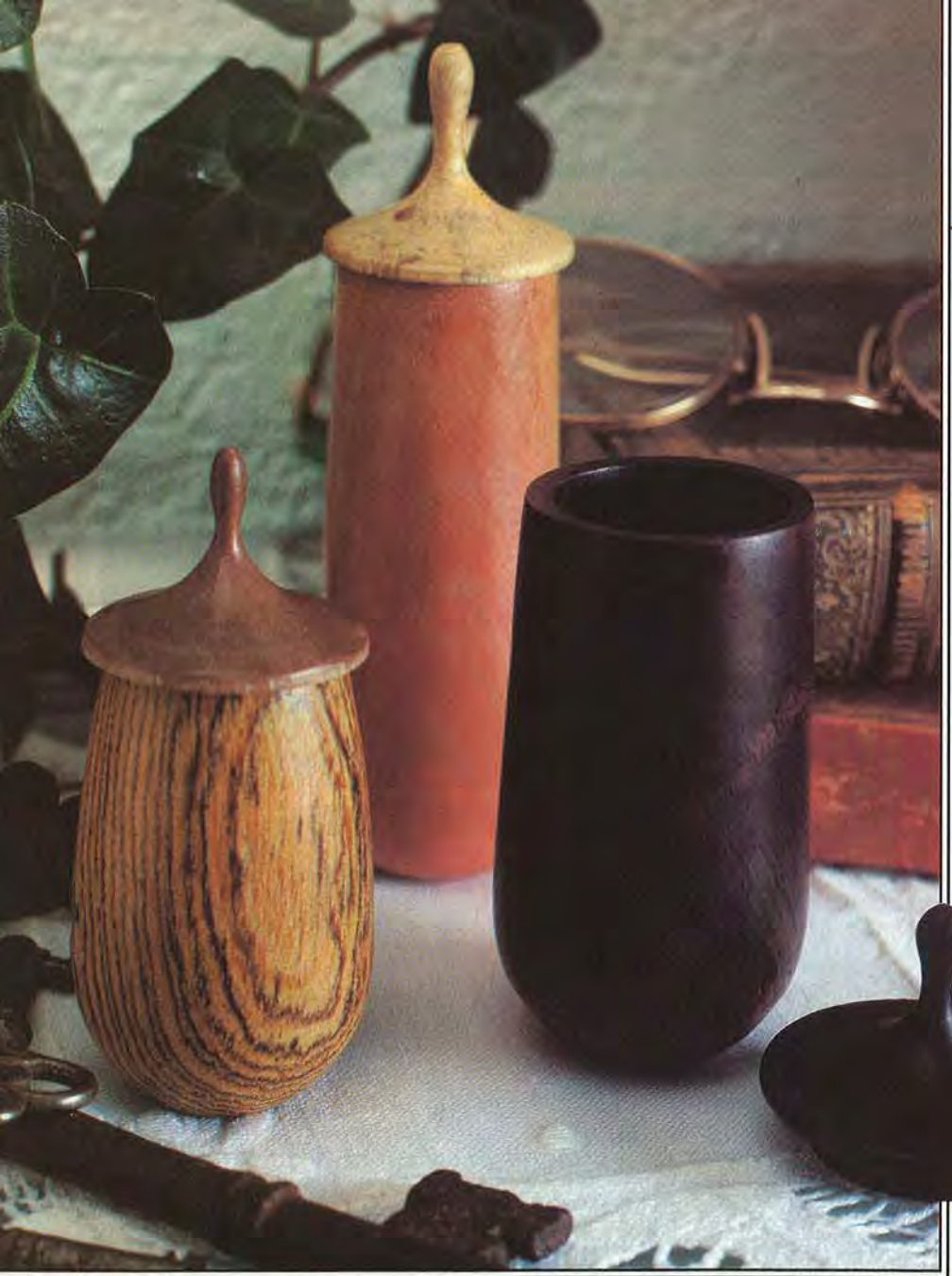
5 Cut cherry and maple plugs to fill the counterbored holes in the body and slats. Plug the holes and sand the plugs flush.

6 Finish-sand, wipe off the dust, and add the finish. (We applied three coats of Minwax Antique Oil Natural Finish, steel-wooling between coats.)

7 As shown on the Bridle drawing, cut five strips of ⅜"-wide leather to the lengths indicated. Purchase your own leather and supplies, or see the Buying Guide for our source. Using a ⅛" leather punch, cut ⅛" holes in the leather where shown. Wrap the leather straps around the rings where shown on the drawing, overlapping the ends 9/16". Secure the leather straps to the horse's head with #6×½" ovalhead screws and finish washers. Rivet the bridle to the 1"-diameter rings.



Written by Marlen Kemmet Project Design: James R. Downing Illustrations: Kim Downing; Lorna Johnson Photographs: King Au



SMALL

There's something satisfying about turning these lovely lidded containers. Maybe it's the way the simple shape showcases the wood's beauty, or it might just be the joy of transforming scrapwood into a treasure. Try it yourself, and see.

Shape the outside

Locate and mark the centers on a 1½×1½×4½" turning square. (All dimensions and the Full-Sized Template, *opposite page*, refer to the middle-size container in the photograph at *left*. You can adjust the size to fit your particular stock, as we did with the two other examples shown.) Mount the stock between centers.

Round the stock to 1⅝". This will be the turning's major diameter. At the headstock end, hold a pencil against the rotating blank 1¼" from the end. Draw another line 2⅜" beyond that one (3⅝" from the end). These marks establish the height of the container. (For the pink ivory one, we marked off a 3" section; for the bocote one, 1⅞".)

With the parting tool, cut in to a diameter of ½" on the outside of each line, leaving a 2⅜"-long section between the parting cuts, shown in the Body Blank illustration. Form a ½" tenon on each end where shown. Leave the tip on the drive end large enough to accommodate the drive center.

Now, shape the body, forming the bottom at the headstock end of the blank. Starting ½" from the headstock end of the central section, cut back and down toward the tenon to form the bottom curve. A ½" spindle gouge or a skew will do the trick. Smooth the curve as you blend it into the side of the cylinder.

Project prep

Stock: You can turn vessels of this style from pieces of square stock 6" long or less. The ones shown are from cocobolo with a macassar ebony lid, pink ivory with a spalted buckeye lid, and bocote with a walnut lid. The how-to instructions refer to the cocobolo container and its lid. For that one, you'll need 1½×1½×4½" stock. The lid calls for 1½×1½×2" material.

Lathe equipment:

Drive center
Live tail center
3–4" faceplate

Spindle gouges
5/32" (or other small size)
½"

Roughing gouge
¾"

Parting tool
⅛" or 3/16"

Skew chisels
½" and 1"

Lathe speeds

Boring
500–800 rpm

Roughing
800–1,200 rpm

Finish turning
1,500–2,000 rpm

Print this article

TREASURES Tiny Turnings from Odds and Ends

Then, starting from the same point and working toward the top (the tailstock end), taper the cylinder to 1⅛" diameter. Rough the taper with a spindle gouge, then finish it with a 1" skew. Keep the tapered side straight.

Part off the turning at the headstock end, where shown by the broken line. Leave the tenon attached to the top of the turning.

Hollow it out

Remove the lathe's drive center, and install a 3-4"-diameter faceplate with a 1½"-thick auxiliary faceplate attached. True the auxiliary faceplate.

Now, bore a hole into the center of the faceplate to receive the turning's bottom tenon. Bore the ½" hole with a gouge, making sure the tenon fits snugly. The hole's depth should be about ¼" less than the length of the tenon.

Glue the bottom tenon into the hole. To accurately center the turning, slide the tailstock up and re-engage the live-center point into the mark it made on the top tenon. Cyanoacrylate adhesive (instant glue) works fine for mounting the workpiece.

After the glue dries, part off the top tenon. Install a drill chuck in place of the tail center, and chuck a ¾" Forstner bit into it. Using a low speed, bore into the body 1⅝" deep. (If you don't have a drill chuck for your lathe, bore about 2" deep into the center of the turning with a ½" gouge.)

Complete hollowing the vessel with scrapers. Enlarge the opening to about ⅞" at the mouth, creating a wall thickness of ⅛". Round the inside bottom to the shape shown by the template, going about 2" deep at the center.

Sand the turning. Measure the inside diameter of the opening, and write down the dimension. Apply a clear finish, then dismount the faceplate with the turning attached. Set it aside to dry.

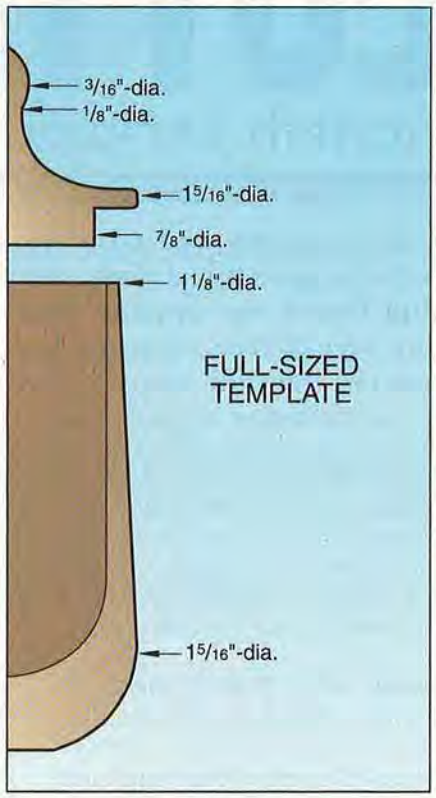
Make the classy cover

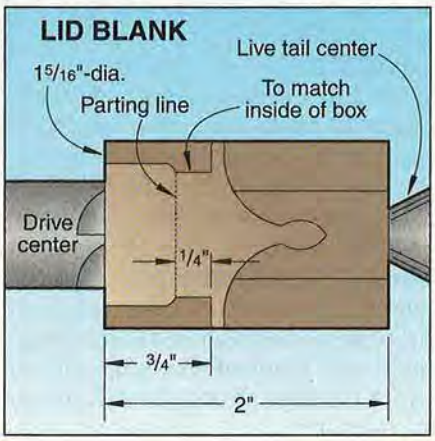
Mark the centers on a piece of stock 1½×1½×2". Mount the stock between centers, and round it down to 1⁵⁄₁₆" diameter. This will be the rim diameter. (When you turn a lid for a container of a different size than the one described, make the lid's rim diameter equal to the major diameter of the body.)

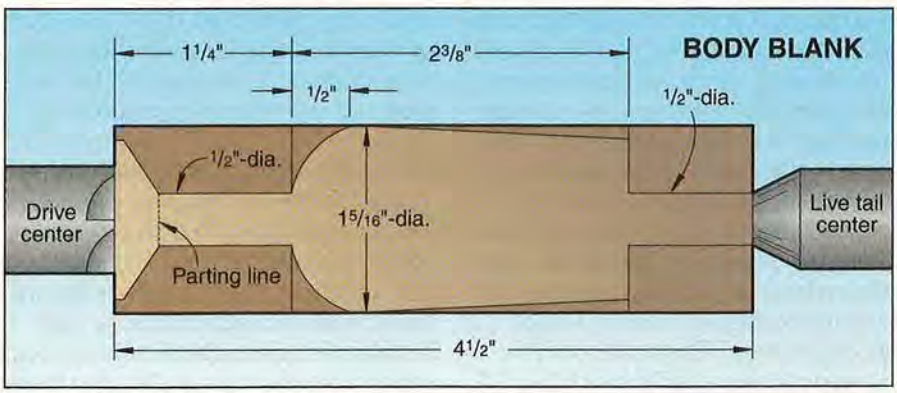
Mark the turning ¾" from the headstock end. On the headstock side of the line, cut in to the diameter you measured as the inside diameter of the container opening. Then, turn a tenon that size at least ¼" long where shown on the Lid Blank illustration.

Begin shaping the top of the lid and the finial. Initially, form the top of the lid as a long tenon, shown in the illustration. Then, taking small cuts, alternately shape the finial and cut in along the parting line shown at the bottom of the lid. The goal is to have very little connecting material left at the bottom of the lid when you separate the waste at the tip of the finial.

Sand and finish the lid. Remount the faceplate with the container body attached, and part off the turning. Aim the tip of the parting tool slightly toward the top to make a concave bottom. Sand and finish the bottom, then start rounding up some scraps for another little lidded box.







Project Design: © Craig Lossing Photograph: Hopkins Associates Illustrations: Roxanne LeMoine

CUTTING-EDGE CUTTING BOARD

Stylish stripes make this one a design leader

Subtle stripes and cutaway corners give this handy cutting board eye appeal. And our stress-free method for making the thin stripes gives it woodworker appeal, too.

Note: We used cherry, walnut, maple, and cardinal wood for our cutting board. You'll need a piece of cherry ¾×8×16"; walnut, ¾×3½×21"; maple, ¾×2×16"; and cardinal wood, ¾×2×16".

Start with the stripes

1 Draw diagonal reference lines across one face of a ¾×8×16" piece of cherry. Joint one edge of the board. Then, rip the piece into nine ¾"-wide strips. Install a sharp, smooth-cutting blade and a zero-clearance throat insert in your tablesaw to avoid circular-saw marks or burning on the sawn edge of the cherry.

2 Lay the strips in order on your bench, aligning the reference marks. Number the pieces 1-9, starting from the left edge.

3 Crosscut the walnut to 16" long. Joint one edge of the long piece, and save the short cut-off piece for use later.

4 Glue the jointed edge of the walnut to the right edge of cherry strip no. 1, using water-resistant glue such as Titebond II. Ensure that both surfaces are flush, then clamp. Protect the edges with scrapwood blocks.

5 After the glue dries, rip the glued-up piece to 1³⁄₁₆" wide, cutting with the cherry against the saw fence, as shown in Photo 1, *opposite page*. The result will be a ¾"-wide cherry strip with a 1⁄16"-wide walnut strip along one edge.

6 Joint the edge of the cut-off piece of walnut if necessary, and glue it to the right edge of piece 2. With the saw still set for 1³⁄₁₆", rip piece 2 to width.

7 Following the same procedure, add walnut strips to the right edge of pieces 3 and 4 and the left edge of pieces 6, 7, 8, and 9. Do not glue any walnut strips to piece 5.

Add red and white accents

1 Joint both edges of a ¾×2×16" maple piece. Glue the walnut edge of piece 4 to the left edge of the maple and the walnut edge of piece 6 to the right edge.

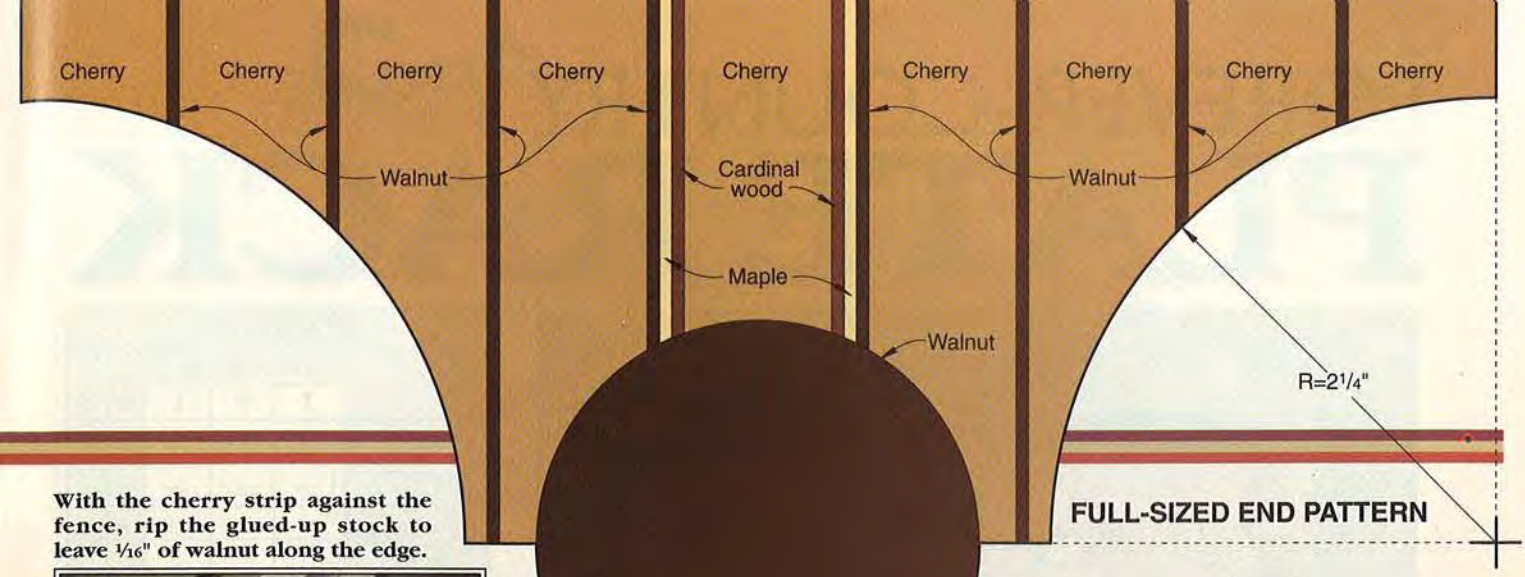
2 After the glue dries, adjust your saw's rip fence to ⅞" cutting width. Place the cherry edge of piece 4 against the rip fence, and saw the strip. Then, saw piece 6 the same way.

3 In the same manner, glue the cardinal wood to the maple edge of pieces 4 and 6. Rip each piece to 1⁵⁄₁₆" wide.

Build the board

1 Lay waxed paper on your benchtop, then arrange pieces 1-9 in order on it. The stripe pattern should match the photo of the completed cutting board.

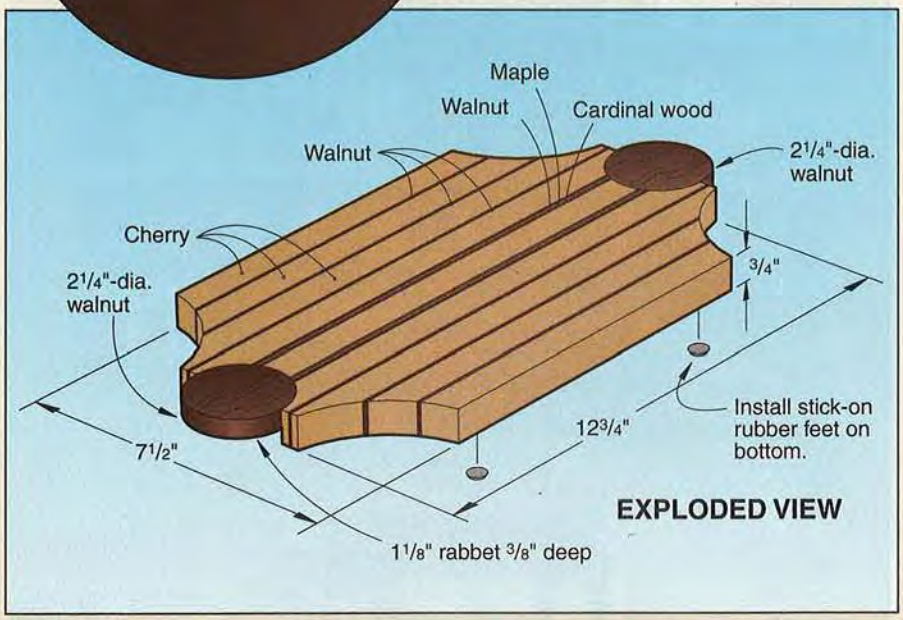
2 Glue the pieces together. Ensure that the glue-up lies flat and that both surfaces are flush. Clamp, protecting the edges with scrapwood. Wipe off the glue squeeze-out with a damp rag.



FULL-SIZED END PATTERN

With the cherry strip against the fence, rip the glued-up stock to leave 1/16" of walnut along the edge.

Cut away the underside of the handle to the straight end of the board. Use the miter gauge for safety and accuracy.



EXPLODED VIEW

3 After the glue dries, remove the clamps. Crosscut the glue-up to 15" long, and sand both sides with 100-grit sandpaper.

4 At each end of the board, mark a point centered from side to side and 1⅛" from the end. Using a Forstner bit and a drill press, bore a 2¼" hole at each point. Back the workpiece with scrapwood, and clamp it to the drill-press table.

5 Photocopy the Full-sized End Pattern, *above*. Place it on the cutting board with carbon paper or graphite transfer paper underneath it, and trace the outline onto the board. Align the semicircular cutout for the handle with the hole drilled through the board. Repeat on the other end.

6 Bandsaw the ends. Cut the curved portions slightly outside the line, then sand to the line with a drum sander.

Put on the handles

1 Open your compass to a 1⅛" radius. Scribe two circles onto the piece of walnut cut off earlier.

2 Bandsaw or scrollsaw the two 2¼"-diameter circles. Since these will be the handles, which must fit exactly into the semicircles on the ends of the board, cut slightly outside the line. Then, carefully sand them to fit the cutouts.

3 Glue the handles into place, and clamp. Ensure that both surfaces are flush. Align the handles' grain along the length the board.

4 After the glue dries, finish-sand the board with 150- and 220-grit sandpaper. Sand both faces and the edges. Eliminate the sharp corners by sanding slight round-overs along all edges.

5 Install a ¾" dado blade in your tablesaw. Adjust the cutting depth to ⅜". Using the miter gauge, carefully saw the notch in each handle back to the square end of the board, as shown in Photo 2.

6 Sand the underside of the handles and the ends of the board. Apply at least four coats of salad-bowl finish, following the manufacturer's instructions.

Project Design: Ted Baldwin
Photographs: Hopkins Associates
Illustrations: Roxanne LeMoine

FOREVER-COUNTRY PLATE RACK

Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
A sides	¾"	11¼"	53"	P	2
B shelves & top	¾"	10¾"	47"	P	4
C dividers	¾"	10¾"	12⅞"	P	2
D top front rail	¾"	4½"	46½"	P	1
E bottom back rail	¾"	3"	46½"	P	1
F top back rail	¾"	3"	46½"	P	1
G back boards	½"	5⅞"	44"	P	8
H front crown molding	3¼" wide		*	P	1
I side crown molding	3¼" wide		*	P	2
J dowel-mount strips	⅜"	¾"	25⅝"	P	4
K divider dowels	⅜" dia.		12⅜"	BD	30
L pin rail	⅜"	¾"	39"	P	1
M shelves	¾"	10½"	9⅞"	P	2

*Length depends on actual width of pine crown molding (width may vary between manufacturers).

Materials Key: P–pine, BD–birch dowel.

Supplies: #8×1½" flathead wood screws, 1" brads, #8×1½ nails, 8–1¼" solid-brass cup hooks, latex paint, stain, clear finish.

Buying Guide
Spindles and shelf clips. 13–1½" spindles with ¼" tenons, SP100; 8–¼"-diameter brass-plated shelf pins, HAF284. Constantines, 2050 Eastchester Road, Bronx, NY 10461. Or call 800/223-8087 to order.

If your taste in furnishings leans toward country, this great-looking plate-rack project may be the answer to your prayers. Measuring 53" from top to bottom and just over 4' wide, it will house a serving for twelve in pleasing country style. Paint it like we did for the look shown here, or finish it to match your own decorating theme.

Print this article

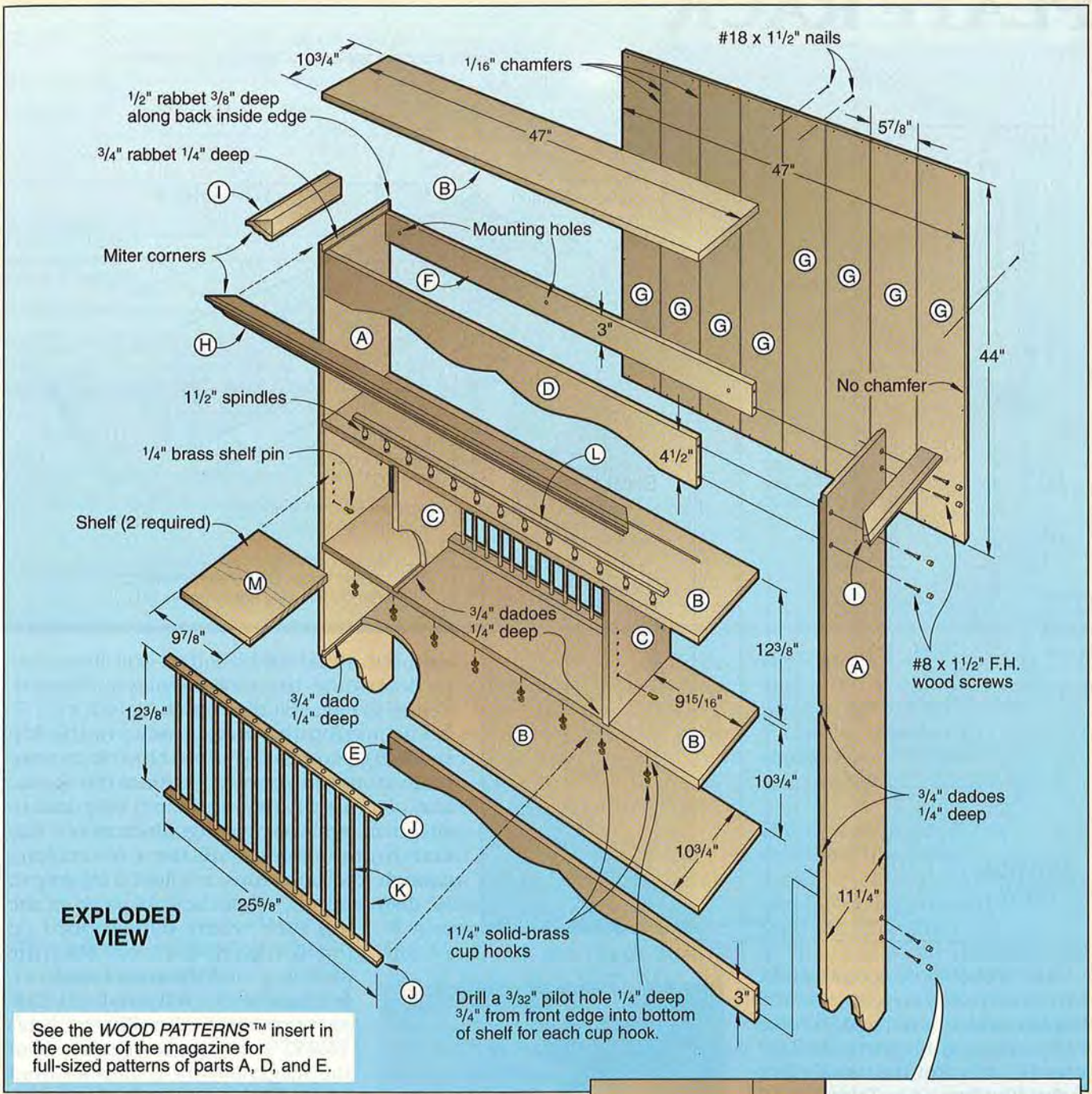
Start with the pine plate-rack sides

1 Cut the sides (A) to the size listed in the Bill of Materials from ¾" stock (we used kiln-dried pine).

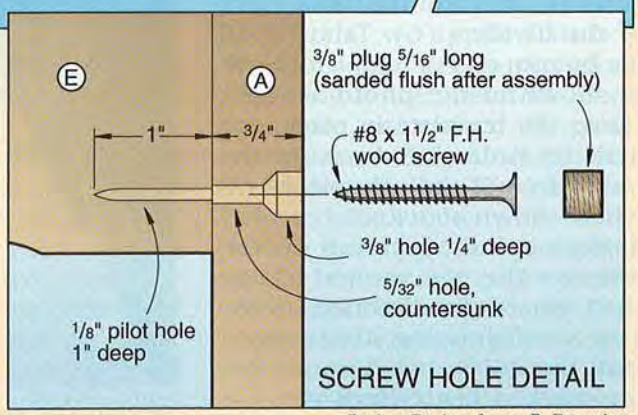
2 Transfer the full-sized side bottom pattern from the *WOOD PATTERNS™* insert in the center of the magazine to the bottom end of one side piece (A).

3 Using double-faced tape, adhere the two side pieces face-to-face, with the edges and ends flush. Cut the bottom end of the taped-together pieces to shape (we used a jigsaw). Now, sand the contoured edges flush.

4 Referring to the Section View drawing, mark outlines for the locations of parts D, E, and F. Mark the six centerpoints, and drill 1/16" guide holes (you'll drill them to exact size later) for securing parts D, E, and F later. Use a wooden wedge to separate the pieces, being careful not to mar the soft wood. Remove the tape. Drill a counterbored mounting hole centered over each 1/16" guide hole on the *outside* face of each side piece. See the Screw Hole detail accompanying the Exploded View for reference.



See the *WOOD PATTERNS*™ insert in the center of the magazine for full-sized patterns of parts A, D, and E.



5 Cut ¾" dadoes and rabbets ¼" deep across the *inside* face of the side pieces where dimensioned on the Section View drawing. Now, rout a ½" rabbet ⅜" deep along the back inside edge of each side piece, *stopping the rabbet* at the bottom dado. Chisel the bottom end of the rabbet square.

The shelves, dividers, rails, and back boards come next

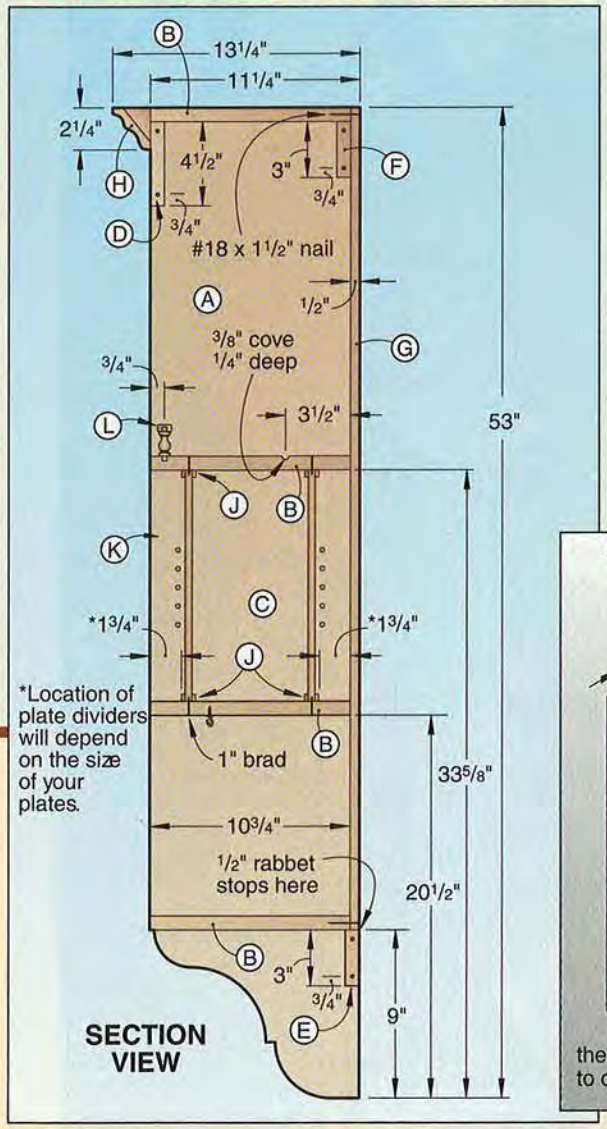
1 Cut the shelves and top (B), dividers (C), top front rail (D), bottom back rail (E), and back top rail (F) to the sizes listed in the Bill of Materials.

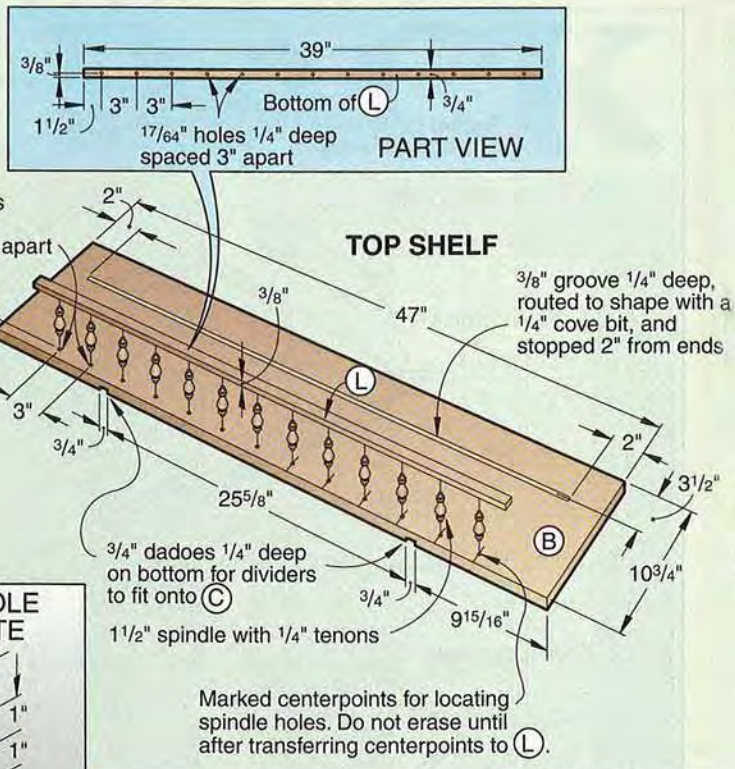
2 For housing the dividers (C), cut a pair of ¾" dadoes ¼" deep in the middle two shelves (B). See the Exploded View and Top Shelf drawings for reference.

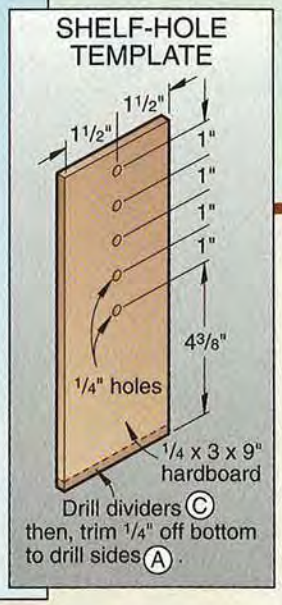
Continued

Project Design: James R. Downing
Photographs: Bill Hopkins
Illustrations: Kim Downing

PLATE RACK







3 Make a shelf-hole template like that shown *above right*. Use the template and a portable drill fitted with a brad-point bit to drill ¼" holes ⅜" deep on the *inside* face of the dividers (C). Trim ¼" off the bottom end of template. Now, as shown in the photo at *right*, clamp the template in place, and drill ¼" holes ⅜" deep on the *inside* face of the side pieces (A) where shown *above*.

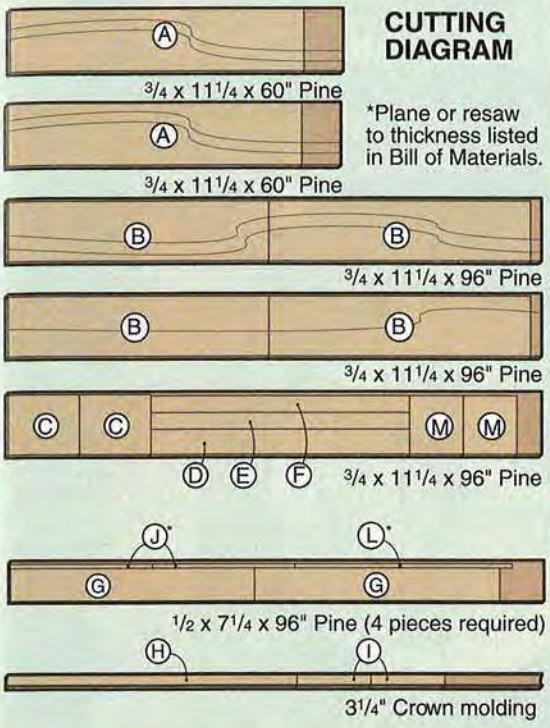
4 Mark spindle-location centerlines on the top surface of one shelf where dimensioned on the Top Shelf drawing *above right*. Drill the holes, but do not erase the marked centerlines yet. (To allow for just a bit of free play when attaching the spindles later, we used a 17⁄64" drill bit. Test-drill holes first to determine the size of bit you'll need. Tenon size on spindles varies slightly.)

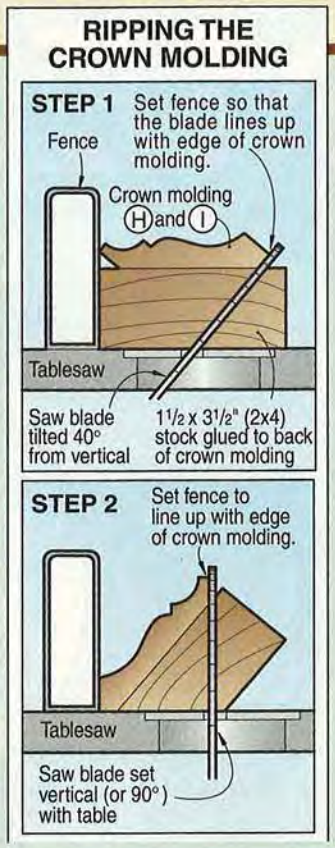
For equally spaced holes and level shelves, make a template and drill ¼" holes for the shelf pins.

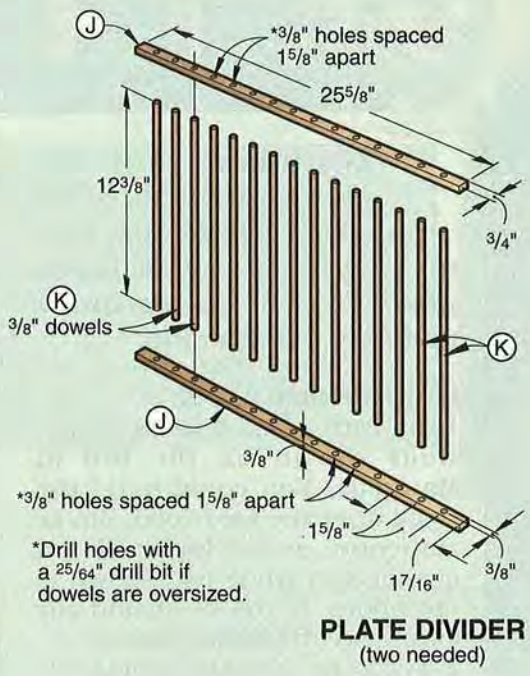
5 For making the plate groove in the top shelf (B), mount a ⅜" core-box bit to your table-mounted router. Position the fence, and clamp stops to the fence. (We had to attach an auxiliary wooden fence to our regular router-table fence for a fence long enough to clamp stops to.) Rout a ⅜" groove ¼" deep and 3½" from the back edge of the top shelf where dimensioned on the Top Shelf drawing. Stop the plate groove 2" from each end.

6 Transfer the full-sized rail half-pattern from the *WOOD PATTERNS™* insert in the center of the magazine to the bottom front edge of the top-rail blank (D). Repeat the process to transfer the other half of the pattern. Cut and sand the piece to shape, and use it as a template to transfer the pattern to the bottom back rail (E). Cut and sand it to shape.

7 Glue and clamp the shelves and dividers (B, C) between the sides (A). Slide the rails (D, E, F) in place, and drive the screws. Check for square. Make sure the back edges of the shelves don't protrude into the rabbets cut in the back inside edges of the side




RIPPING THE CROWN MOLDING
STEP 1
Set fence so that the blade lines up with edge of crown molding.
Fence
Crown molding H and I
Tablesaw
Saw blade tilted 40° from vertical
1 1/2 x 3 1/2" (2x4) stock glued to back of crown molding
STEP 2
Set fence to line up with edge of crown molding.
Tablesaw
Saw blade set vertical (or 90°) with table



pieces. You'll fit the back boards (G) into these rabbets next.

8 Cut the ½"-thick back boards (G) to size. Check their fit in the rabbeted back of the plate rack. Allow ⅛" clearance at the two outside edges for expansion. Cut a 1/16" chamfer along the front edge of each where shown on the Exploded View drawing. Do not install the back boards yet.

Top off the rack with decorative crown molding

1 To add the pine crown molding (H, I), purchase a 3¼"-wide by 8'-long piece at a local home center. Select a straight, dry 2×4, and glue it to the back of the crown molding where shown on Step 1 of Ripping the Crown Molding drawing. Rip the edges where shown in Steps 1 and 2 of the drawing.

2 Measure and miter-cut the front piece (H) to length, and glue it to the top front of the plate rack. Repeat for the sides (I).

Add the plate-divider and pin-rail assemblies next

1 Cut the four dowel-mount strips (J) to size. Tape them together face-to-face, with the edges flush.

2 Mark the hole centerpoints on the top piece where dimensioned on the Plate Divider drawing. Mount a fence to your drill-press table to keep the holes centered edge-to-edge, and drill the ⅜" holes through all four taped-together pieces.

3 From ⅜" birch dowel stock, crosscut the plate divider dowels (K) to length.

4 Assemble (no glue) the plate dividers (J, K), and check their fit in the plate rack. You want the assemblies to slide in easily now because they'll be tighter after the project has been painted. Trim the dowels if necessary.

5 Cut the pin rail (L) to size. Center it end-to-end against the front edge of the top shelf (B), and use a square to transfer the marked centerlines on the top shelf to the pin rail. Use your drill press fitted with a fence and stop to drill the holes in the pin rail where marked. Now, erase or sand the marked centerlines off both the pin rail (L) and top shelf.

6 Glue the spindles into the holes in the pin rail. Then, fit (no glue) the bottom ends of the spindles into their mating holes in the top shelf and let the glue dry. This aligns the spindles for gluing in place in the top shelf later.

7 Cut the shelves (M) to size. Put shelf pins in the holes in the project, and test-fit the shelves.

Paint and stain for a contrasting finish

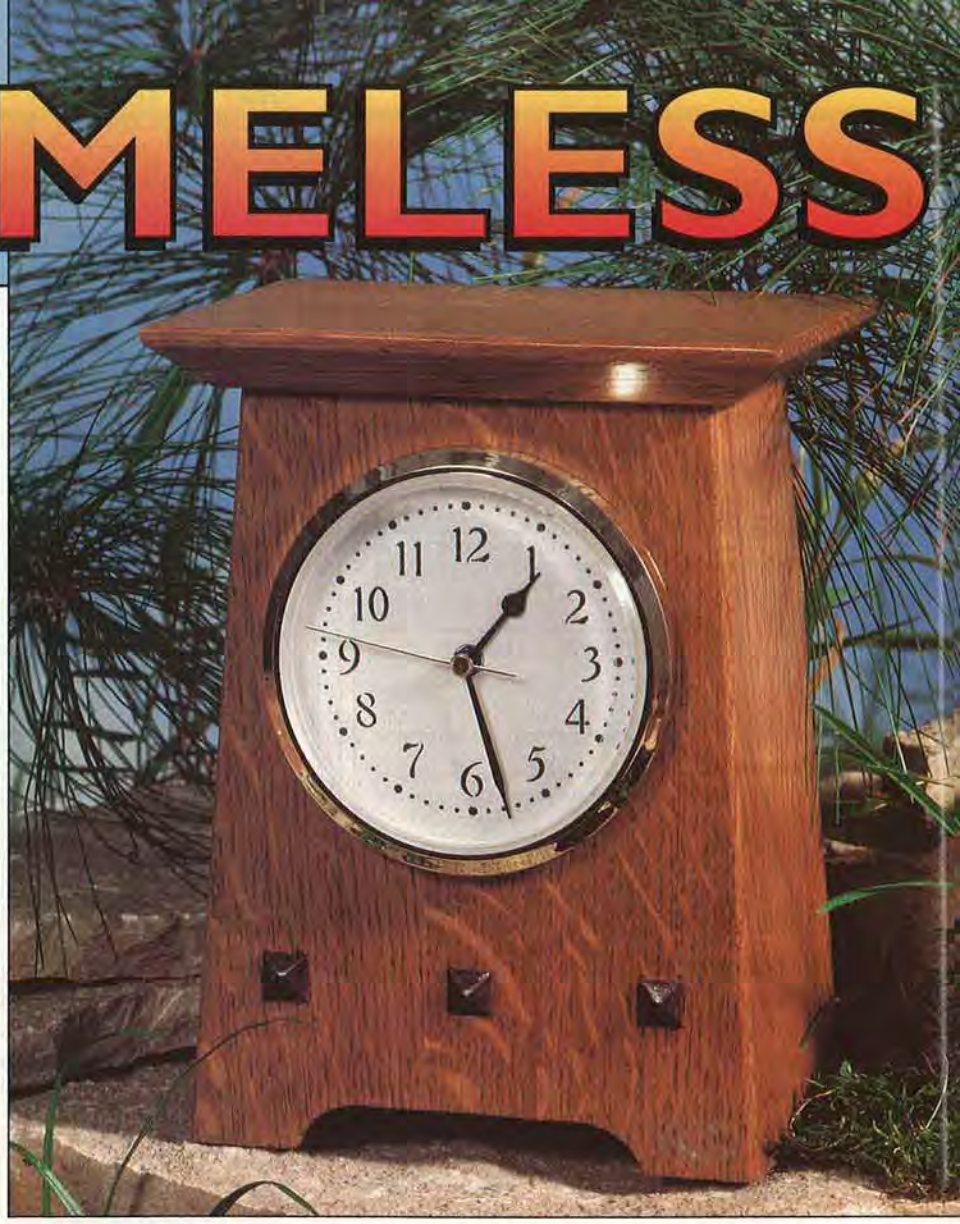
1 Cut ⅜" plugs 5/16" long, and glue one into each counterbored hole. Sand the plugs flush.

2 Finish-sand all the parts (we sanded through 320-grit).

3 Paint the plate rack where shown in the opening photo. Stain the remaining pieces (G, K, J, L) and the spindles. (For an even stain, we applied Minwax Wood Conditioner to the pieces according to the directions on the can. Then, we stained the pieces with Minwax Early American stain and Minwax Fast-Drying Satin Polyurethane.)

4 Mark the cup-hook centerpoints on the bottom side of the second shelf (B). Drill pilot holes, and screw the hooks in place. Next, nail the back boards (G) in place with #18×1½" nails. Using 1" brads, nail the plate dividers and spindle assembly in place.

TIMELESS



Reminiscent of the Arts and Crafts style popular early in this century, this oak clock looks great anywhere. It's quick and easy to build, too.

Cut the case parts

1 Cut Parts A and B to the dimensions shown on the Bill of Materials. You could build the clock from any hardwood. But an authentic, period look calls for quartersawn white oak, shown in the photo. If you can't find any locally, see the Buying Guide.

2 Tilt your tablesaw's blade 4° from vertical, then bevel both ends of all four pieces. Saw the bevels so they're parallel; that is, saw one end of each piece with one face down, the other end with the other face down.

3 Refer to the full-sized patterns *opposite page*, and lay out the tapered sides on the front of each part A and part B. (With the part standing upright, the front slants back toward the top.)

4 Bandsaw the tapered sides, with the blade 90° to the table. Saw slightly outside the line, then sand or plane down to it. (If you have a taper-cutting jig for your tablesaw, you can use it to cut these parts.)

5 Lay out the bottom profile on each part A. Bandsaw the cutouts, using a ⅛" blade. Sand.

6 Cut the top filler (C) from ½"-thick stock. Rip an oversized piece to width first, with the tablesaw blade again tilted 4°. Then, cut the piece to length, bevel-cutting the ends. (The bevels converge, as shown on the Exploded View drawing.)

7 Using a holesaw or circle cutter and drill press, bore the 3" hole in the clock front where shown. Be sure to back the workpiece with scrapwood, and clamp both pieces securely to the drill-press table before boring.

Assemble the case

1 Lay the back (A) on your bench, the good side facing down. Glue the sides (B) and filler (C) to the upturned face, flush with the edges and top. Glue on the front.

2 Holding the clock case together while the glue is still tacky, stand it on your workbench. Align the front and back so the clock stands straight and steady, then clamp with rubber bands.

3 Cut the top (D) to size. Saw or rout a ⅜" chamfer around the bottom edges. Sand the top.

4 After the glue dries, sand the body. Glue the top into position—note that the smaller face joins to the clock body. Clamp the top.

Add the decorative buttons

1 Cut a piece of ⅜" square stock about 12" long. Choose a species that contrasts with your clock body. (We used walnut.) The extra length allows more safety and convenience when making the small buttons.

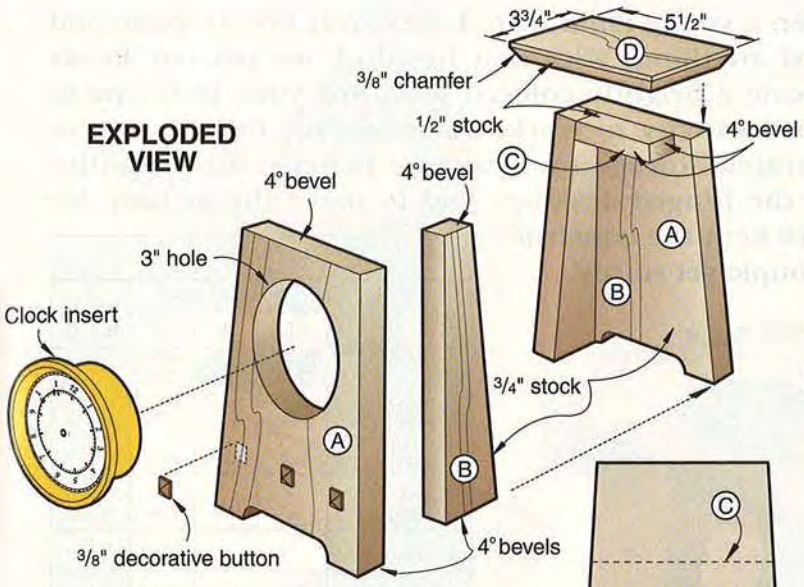
2 Set the miter gauge on your disc sander to 30°. On one end of the square stock, carefully sand a beveled face extendng from one edge to the middle.

3 Turn the stock to the next face, and sand another bevel on the same end. Similarly, turn the stock to each of the remaining faces and bevel the end. All four beveled faces should meet in a point at the center of the end.

4 You'll end up with a pyramidal shape on one end of the square stock. Using a dovetail saw or other fine-toothed handsaw, cut the pointed end off 1/16" below the bottom edge of the bevels.

Print this article

TIMEKEEPER



Buying Guide

Quartersawn oak. Enough quartersawn white oak to build one clock case, item ART-BR-Wood, $12.95 ppd. in U.S.

Quartz clock insert. Style shown, item no. 200220, $15.95 ppd. in U.S.

Both from Schlabaugh and Sons Woodworking, 720 14th St., Kalona, IA 52247. Call 800/346-9663 to order.

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
A front & back	¾"	5"	6⅜"	O	2
B side	¾"	1⅝"	6⅜"	O	2
C *filler	½"	⅞"	2¹¹⁄₁₆"	O	1
D top	½"	3¾"	5½"	O	1

*Cut this part oversize initially, then cut to finished size in accordance with how-to instructions.

Materials Key: O–quartersawn white oak

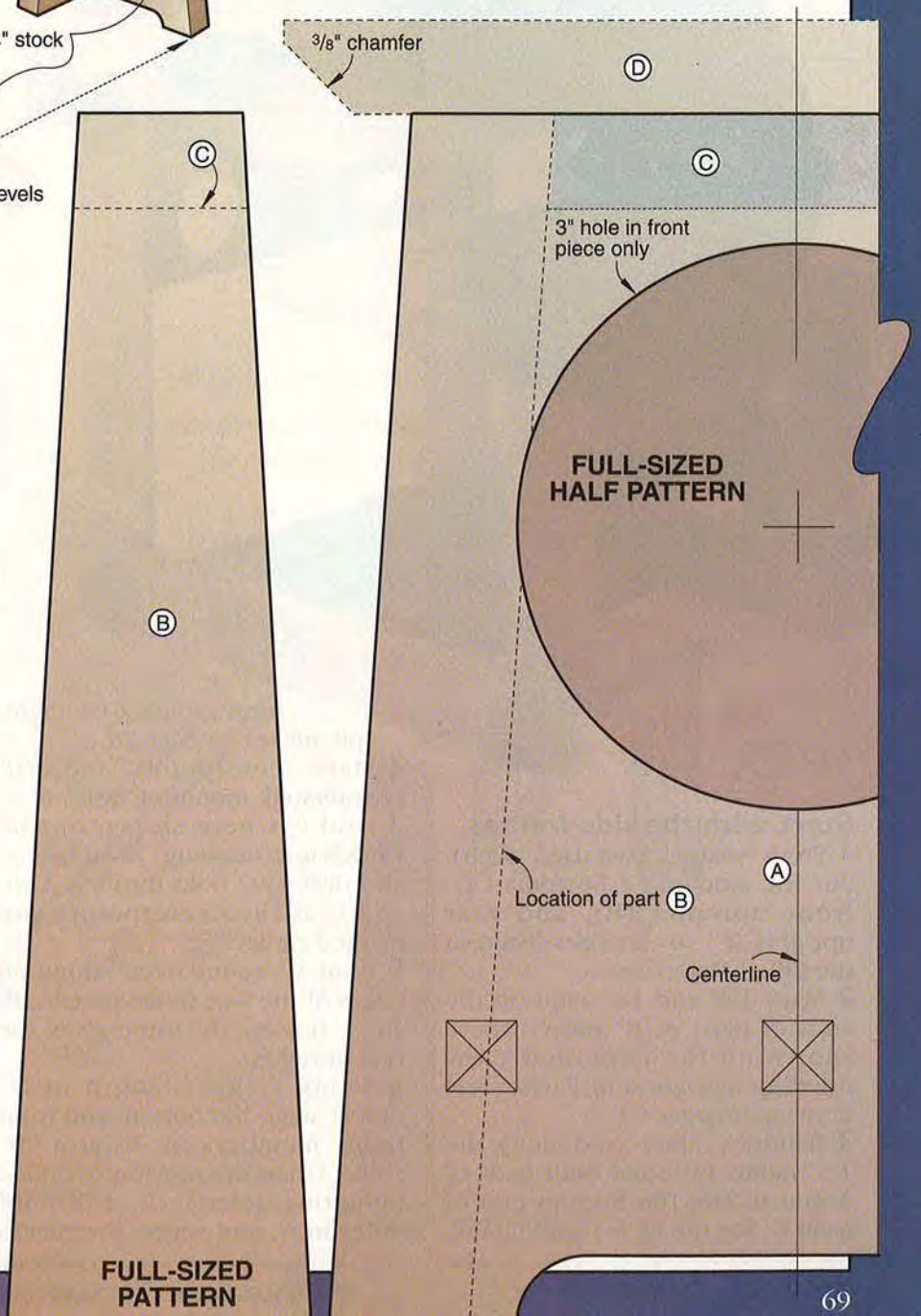
5 Make two more buttons the same way. Glue the three buttons to the front of the clock where shown on the pattern. (A piece of masking tape makes a great guideline to keep them level.)

Complete the clock

1 Apply a clear finish overall. If you want to give your clock an aged appearance, darken it with golden oak stain first.

2 Install the battery in the clock insert, and set the time. Finally, fit the clock insert into the hole in the front of the case.

Project Design: Schlabaugh and Sons
Photograph: John Hetherington
Illustrations: Roxanne LeMoine, Lorna Johnson



YOUNG-ARTIST'S ACTIVITY

We've never seen a young child who doesn't just love to paint and draw on almost anything. With that in mind, we put our heads together to create a brightly colored place for your little one to put his or her creativity to work. To encourage tidiness, we've incorporated storage for crayons, pencils, and supplies under the hinged desktop. And to make things easy for you, we kept the construction simple yet sturdy.

Start with the side frames

1 From ¾"-stock (we used birch), cut the side-frame bottoms (A), front uprights (B), and rear uprights (C) to the sizes listed in the Bill of Materials.

2 Mark 1¼" and 1¾" radii on the ends of parts A, B, and C where shown on the Exploded View drawing at *right* and Parts View drawing on *page 92*.

3 Bandsaw, then sand along the 1¾" radius to round both ends of A and B, and the bottom end of each C. See the jig for sanding uniform radiuses on multiple pieces on *page 28*.

4 Mark centerpoints, and drill countersunk mounting holes in A, B, and C where shown on the Parts View drawing. Switch bits, and drill a ¾" hole through A, B, and C at the centerpoints you marked earlier.

5 Rout ¼" round-overs along all edges of the side frame parts A, B, and C (except the top ends of the rear uprights).

6 Using a short length of ¾" dowel, align the bottom and front frame members (A, B) at a 90° angle. Using the previously drilled mounting holes in B, drill pilot holes in A, and screw the pieces

Continued

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
SIDE FRAMES					
A bottoms	¾"	3½"	23¾"	B	2
B front uprights	¾"	3½"	22⅛"	B	2
C rear uprights	¾"	3½"	13¾"	B	2
D dowel	¾" dia.		20¾"	D	1
E dowel	¾" dia.		19¼"	D	1
F caps	½"	3" dia.		B	6
SEAT AND DESK SUPPORTS					
G seat crossmember	¾"	2"	15½"	B	1
H seat support	¾"	3"	15½"	B	1
I desk crossmember	¾"	5¼"	18½"	B	1
J desk support	¾"	7½"	18½"	B	1
K brace	¾"	5"	5"	B	1
L cleats	¾"	¾"	14¾"	B	2
FLOORBOARDS AND SEAT					
M floorboards	¾"	3½"	17"	B	4
N* seat	¾"	9"	18½"	EB	1
DESKTOP					
O desk sides	½"	3¼"	16"	B	2
P front	½"	3¼"	18"	B	1
Q back	½"	1"	18"	B	1
R bottom	¼"	15¾"	18¼"	PL	1
S front	¾"	4"	24"	BP	1
T top	¾"	15"	24"	BP	1
U pencil stop	¼"	1"	20"	B	1

*Initially cut parts marked with an * oversized. Trim to finished size according to the instructions.

Materials Key: B–birch, D–dowel, PL–plywood, EB–edge-joined birch, BP–birch plywood.

Supplies: #8x¾", #8x1", #8x1¼", #8x2" flathead wood screws; 1½x23½" continuous hinge, ¾"-diameter dowel stock, plastic containers, enamel paint; clear finish.

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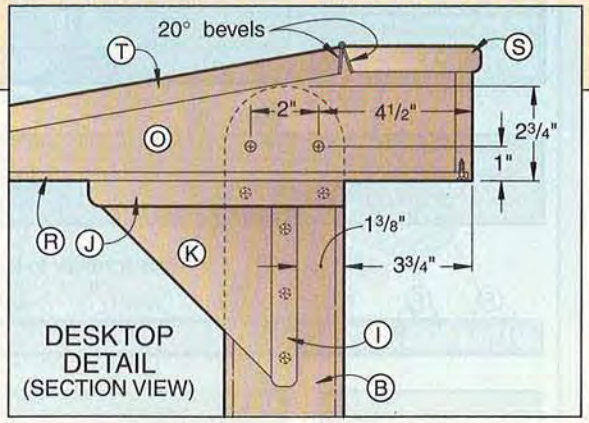
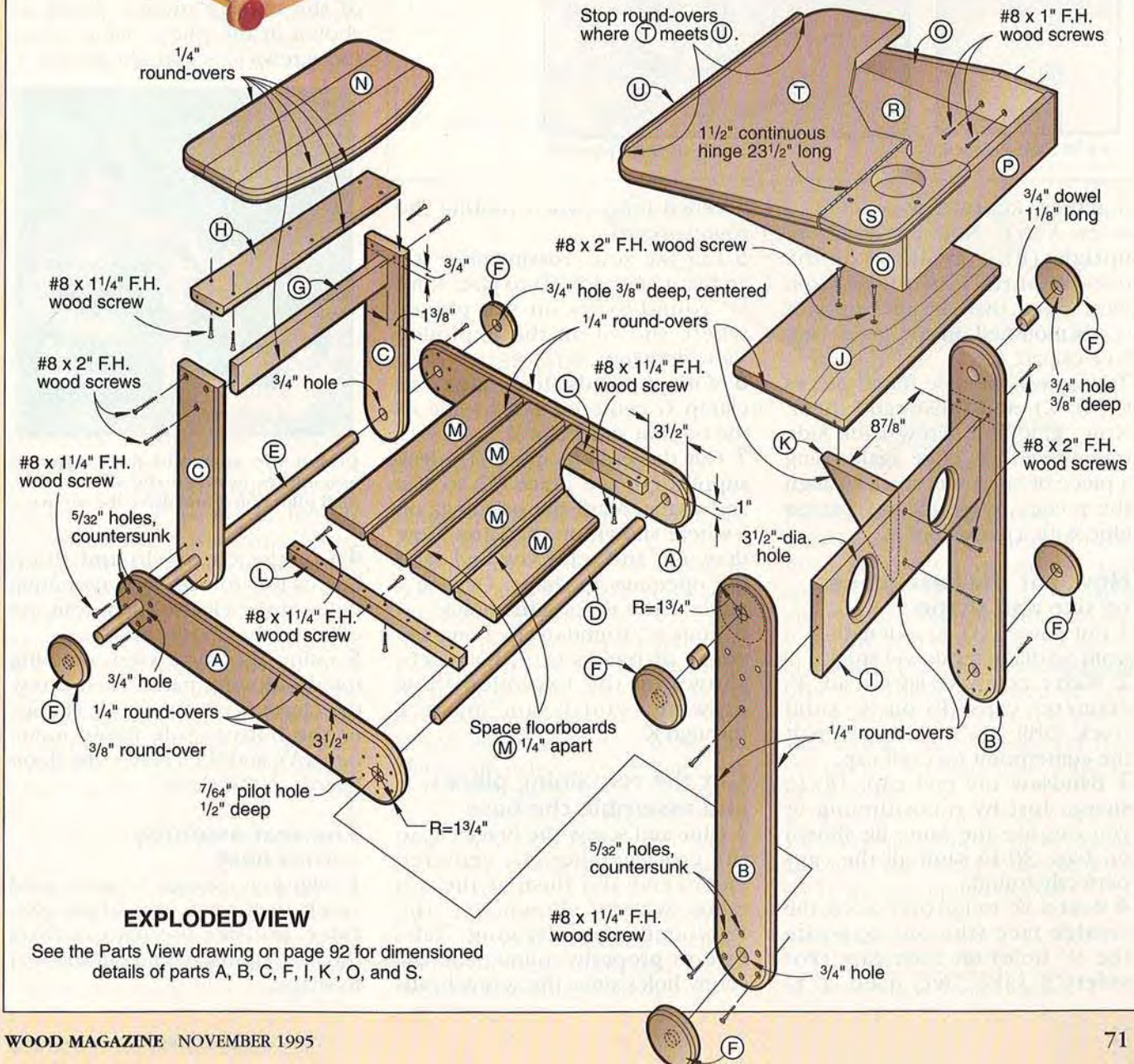
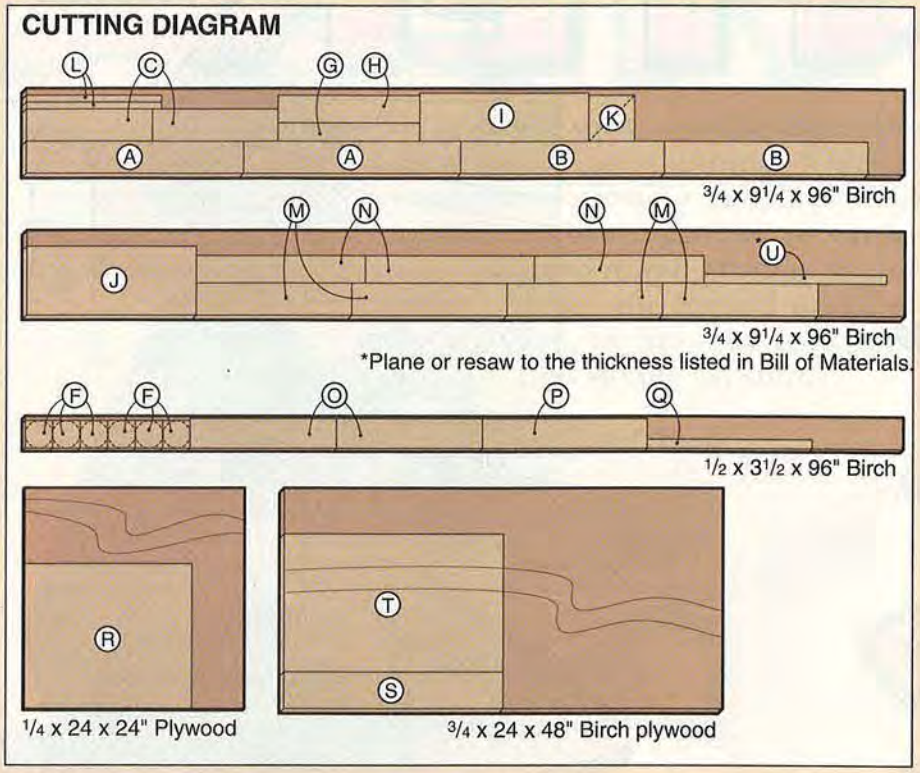
CENTER





EXPLODED VIEW

See the Parts View drawing on page 92 for dimensioned details of parts A, B, C, F, I, K , O, and S.



together. Repeat the process to screw A to C. Note that the front upright (B) is mounted on the *outside* surface of the bottom part A and that the rear upright (C) is mounted on the *inside* surface of part A.

7 Unscrew the side frame pieces (A, B, C), and finish-sand them. Now, glue and screw each side frame together, once again using a piece of ¾" dowel stock to align the pieces. Wipe off any excess glue with a damp cloth.

Now, cut the base pieces to size and shape

1 Cut dowels (D, E) to length from ¾"-diameter dowel stock.

2 With a compass, lay out six 3"-diameter caps (F) on ½" solid stock. Drill a ¾" hole ⅜" deep at the centerpoint on each cap.

3 Bandsaw the end caps (F) to shape. Just by repositioning it, you can use the same jig shown on *page 30* to sand all the caps perfectly round.

4 Rout a ⅜" round-over along the outside face (the one opposite the ¾" hole) on each cap. (For safety's sake, we used a V-notched fence when routing the round-overs.)

5 Cut the seat crossmember (G) and seat support (H) to size. Rout ¼" round-overs on the pieces where shown on the Exploded View drawing.

6 With the ends flush, glue and clamp G centered side-to-side to the bottom surface of H.

7 Cut the crossmember (I), desk support (J), and brace (K) to size and shape. Mark the openings on I where shown on the Parts View drawing, and scrollsaw and sand the openings to shape. Or, use a circle cutter to form the holes.

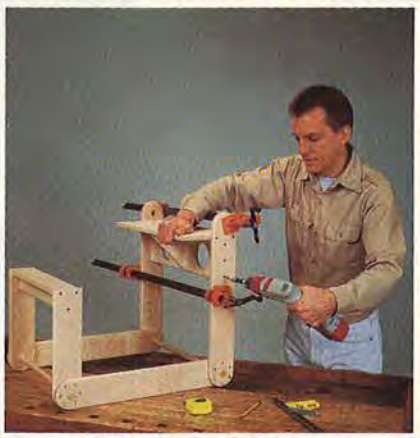
8 Rout ¼" round-overs along the edges of pieces (I, J, K) where shown on the Exploded View drawing. Finish-sand parts F through K.

Cut the remaining pieces, and assemble the base

1 Glue and screw the brace (K) to the crossmember (I), centered end-to-end and flush at the top edge where shown on the Exploded View drawing. Take care to properly countersink the screw holes since the screw heads will be exposed. All our screw-heads sit 1/16" below the surface of the wood that they're screwed through.

2 Glue and clamp the desk support (J) to the assembled parts (I/K). The desk support (J) should overhang the front edge of the desk crossmember (I) by 1⅜" where shown on the Desk Top detail accompanying the Exploded View drawing.

3 Using bar clamps, secure assemblies G/H and I/J/K between and at a right angle to the side frames. Using the previously drilled holes in pieces B and C as guides, drill pilot holes centered into the ends of the mating pieces. Then, as shown in the photo *below*, drive the screws to secure the pieces.



Clamp the seat and desk support assemblies between the side frames, drill pilot holes, and drive the screws.

4 Cut the cleats (L) and floorboards (M) to size. Drill mounting holes in the cleats. Then, rout the edges of the floorboards.

5 Using the Parts View drawing for positioning particulars, screw the cleats (L) to the inside surface of the bottom side frame members (A), and then screw the floorboards to the cleats.

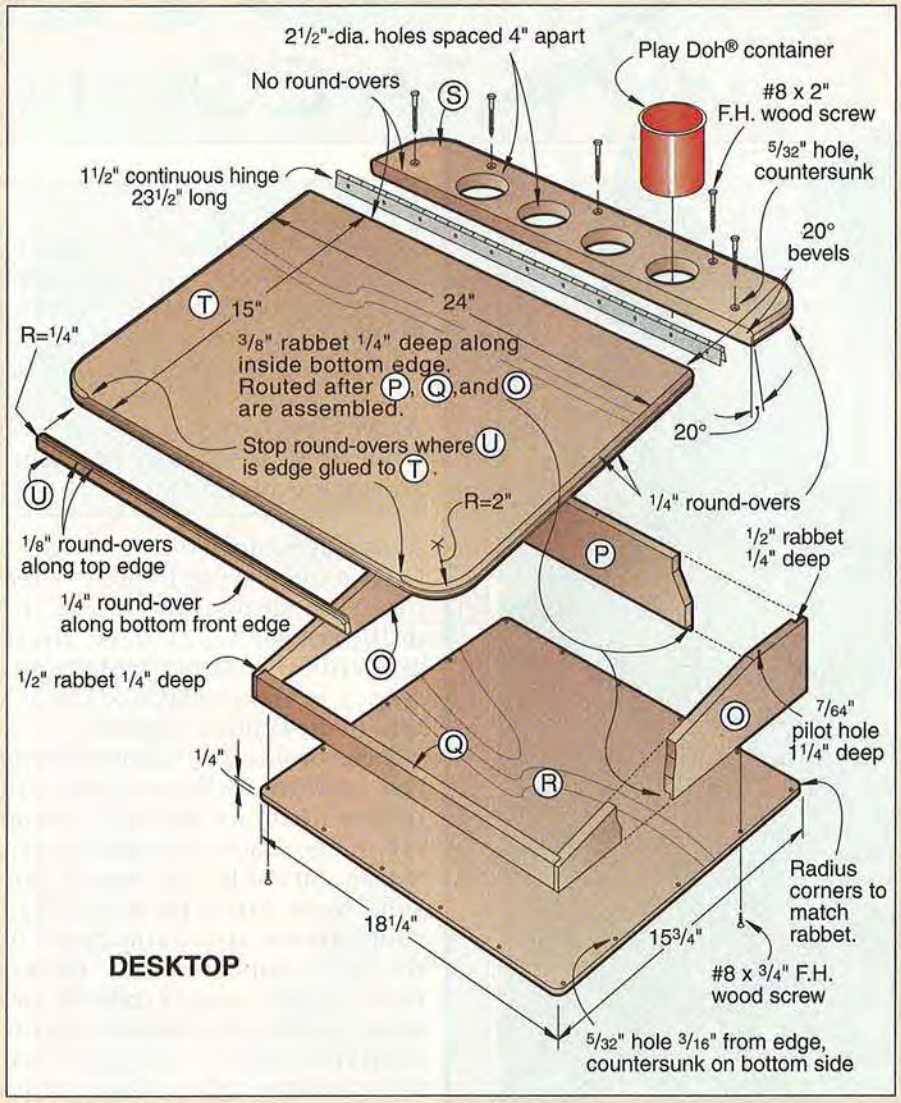
The seat assembly comes next

1 Edge-join enough ¾"-thick solid stock to form a seat blank (N). Later, transfer the pattern from the pattern insert, and cut the seat to shape.

2 Rout a ¼" round-over along the top and bottom edges of the seat.
3 Position and clamp the seat to the seat support (H). The back edge of the seat overhangs the back edge of the seat support by 2⅜". Drill mounting holes and screw the pieces together.

Now, let's add the desktop

1 Using the Parts View drawing, transfer the pattern and cut a pair of the desktop sides (O) to size from ½" stock. Cut a ½" rabbet ¼" deep along both ends of the desk sides. Then, mark the centerpoints, and drill a pair of countersunk mounting holes through each desk side for screwing them to the front uprights (B) later.
2 Cut the desktop front (P) and back (Q) to size.
3 Glue and clamp the desktop pieces (O, P, Q) together, checking for square. Later, rout a ⅜" rabbet ¼" deep along the bottom inside edge of the desk assembly where shown on the Desktop drawing at *right*.
4 Cut a piece of ¼" plywood to fit the rabbeted opening in the desktop bottom. Sand the corners of the desktop bottom (R) to fit the round-rabbeted corners. Drill mounting holes, and glue and screw the bottom piece in place.
5 Position the desktop assembly (O-R) where shown on the Desktop detail accompanying the Exploded View drawing. Using the previously drilled holes in the front uprights (B) as guides, drill pilot holes, and screw the desktop assembly in place.
6 Cut the desktop front (S), desktop (T), and pencil stop (U) to the sizes listed in the Bill of Materials, bevel-cutting the mating edges of S and T at 20°. Cutting the mating edges at 20° and leaving a gap between the hinge helps prevent tiny fingers from getting pinched at the joint.
7 Mark and cut a 2" radius on the bottom corners of the desktop (T) and desktop front (S). Measure the diameter of your plastic containers (we used Play Doh® containers), and cut four holes in the desktop front (S).
8 Rout the edges of desktop pieces S and T where shown on the Desktop drawing. Note that the round-over stops where the pencil stop (U) will be attached. Rout or sand ⅛" round-overs on the edges of the pencil stop where shown *above*. Glue and clamp the pencil stop in place.
9 Use a hacksaw to cut a piece of 1½" continuous hinge to 23½" long. Drill pilot holes, and screw the hinge centered end-to-end to parts S and T.
10 Position the desktop assembly (S, T, U) on the desk base (O-R), drill mounting holes, and screw the two assemblies together.



Finish-sand and paint

1 Disassemble the desk, finish-sand all the components, and apply a clear finish to those parts shown in the opening photo. Paint the other pieces with enamel paints. (For the smoothest and brightest finish, we used aerosol spray paints for both the prime and finish coats. Be certain that the primer is compatible with the finish coats.)
2 Reassemble the desk. Cut two 1⅛"-long pieces of ¾" dowel stock and glue the two remaining caps (F) to the assembled desk.

Written by Marlen Kemmet
Project Design: James R. Downing
Illustrations: Kim Downing; Lorna Johnson
Photographs: King Au; John Hetherington

THE GREAT
A COLLECTIBLE THE

Primitive describes the style but certainly not the look of this beautiful carved heron. Based on old-time decoys, this is one carving that's sure to attract a lot of attention.

Project prep

Stock: White cedar, red cedar, pine, basswood, or other carving wood. Sizes: Body, 4×7×15"; neck, 2×4½×4½"; head, 2×4×10". See the Buying Guide for precut kits.

Carving tools: You can use gouges or power-carving equipment for this project.

Although protected by law today, herons once were hunted. Their plumage and skin prized by milliners for fancy hats, these graceful shoreline waders put money in the pockets of many a turn-of-the-century bayman.

These professional hunters along the eastern seaboard relied on decoys to attract the birds within gun range. Such working decoys, usually carved by the hunter himself, were often no more than rough-hewn approximations of the bird's shape. But some carvers modeled and painted their decoys more realistically, thus establishing identifiable carving styles. Later, when folk-art collectors took an interest in the decoys, some of these carvings became more prized than the birds themselves once were.

Carver Frank Russell of Cambridge, Vermont, based this carving of a great blue heron on those old-time gunners' decoys. "I call this carving a decorative contemporary primitive," he says. "It's in the style of the old, primitive working decoys, but it's strictly decorative."

The completed carving should look like an old decoy that's been dragged out of an outbuilding or an attic. Given that, you can take a lot of leeway with your heron, detailing it, painting it, and distressing it as much or as little as you like.

First, cut out the blanks

Photocopy the body, neck, and head patterns from the *WOOD PATTERNS™* insert in the middle of the magazine. Attach the patterns to the appropriate stock with rubber cement. Carefully register the two views for the head and body.

Bandsaw the Body Side View first. Saw the flat surface for the neck joint, then make a continuous cut along the bird's back. Remove the waste from the back in one piece. (We'll call this the top waste piece since it will face up when you cut the back view.) Then, saw along the bird's breast, which will be the bottom. Save that waste piece, too.

This is a convenient time to drill the hole for the leg stake, so stand the body on its neck-joint surface on the drill-press table. Chuck a ½" bit in your drill press, and tilt the table to match the hole angle shown on the pattern. Stabilize the body with clamps, then drill a hole 3" deep where shown, centered side-to-side.

After drilling the hole, put the top and bottom waste pieces back onto the body. Fasten them with a few wraps of masking tape. (Don't put on so much tape that you hide the pattern line on top.) Bandsaw the top view. After sawing the body, cut out both views of the head the same way. Then, saw out the side view of the neck. Draw a centerline along the edge all around each part.

Locate and mark the center on the joining surfaces of the head, neck, and body. You can draw diagonal lines on the neck and body surfaces to find the center. On the head, pick a point about midway along the centerline on the mating surface.

On both surfaces of the neck-to-body joint, draw a 1¾"-diameter

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BLUE HERON
MINUTE YOU FINISH CARVING IT

circle around the centerpoint. Draw a 1⅝" circle on each surface of the head-to-neck joint. Then, drill a ¼" dowel hole 1½" deep at each centerpoint. Be careful to drill perpendicularly to the surface to allow rotation of the neck and head for positioning later.

Rough out the body

Begin rough-shaping the heron body by removing the square corners left by bandsawing. "When roughing out the blank, think of the egg that the bird came from," Frank suggests. "There are no square corners." Bandsaw or carve the corners to a roughly 45° angle, following the Bevel Line on the Side-View pattern. This should leave a band 1¾-2" wide along the middle of the front and back, as in Photo 1.

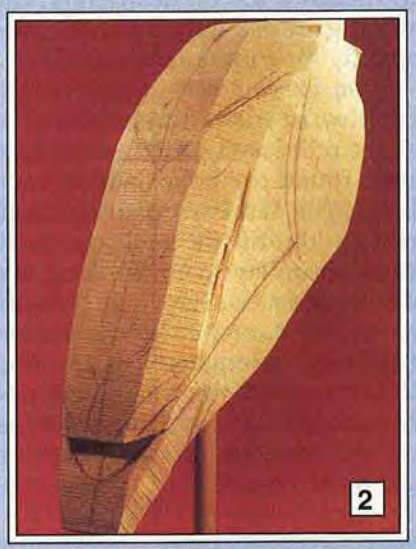
Refer to the patterns and Photos 2 and 3, then sketch guidelines for the wings and breast plume onto the body. Round the body to the shape suggested by the cross-section illustration A-A and Photos 4 and 5. Undercut the lower edge of the wing line toward the bird's tail as you round the body. Also, narrow the body slightly in front of the wing line so the wings will appear to be laid over the body.

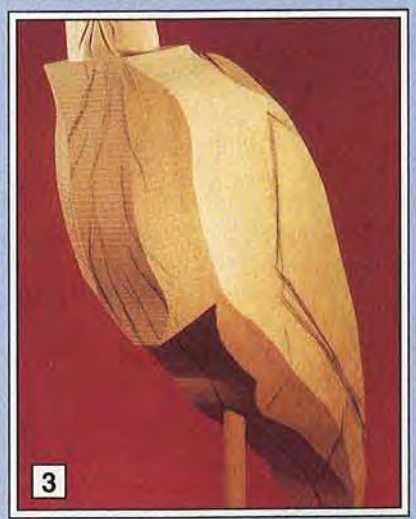
And don't be timid about rounding. "Beginners' carvings always look square," Frank comments. He figures that fear of cutting away too much wood, largely caused by not knowing the subject, leads to the blocky look. To avoid that, study the in-progress photos as well as the photo of the completed carving. Refer to any photos or illustrations of herons you can find in books and magazines, too. The more pictures, the better. "You can't carve what you don't know," counsels the carver.

Continued

1 Here are the head, neck, and body blanks ready to carve. Corners have been bandsawn from the body blank.

2, 3 Guidelines show wing outline as well as locations for major feather groups and chest plume. As you carve away lines, redraw them.





4, 5 Distinctly set out the wings, tail, and chest plume as you shape the body. Round the forms to avoid blockiness.

Undercut the wings over the tail. Shape the tail, again relying on the photos. Round the neck attachment point to the diameter established by the circle.

Carve the head and neck

Following the pattern drawing and Photo 6, pencil the carving lines onto the head blank. Round the corners of the head and rough-shape the beak. Shape the round surface to join to the neck. Bring the neck to a round section, carving to the diameters of the circles on the ends.

Temporarily install the head and neck on the body with dowels. Cock the head slightly to the bird's left, and glue it to the neck. Dowel the joint for strength. Blend the neck and head together, filling the joint, if necessary.

Carve the crest at the back of the head and the detail lines shown in Photo 7. Drill a ⅜" hole about ¼" deep at the eye location on each side. Make sure the eyes are located at the same spot on each side. (The heron takes 11 mm glass eyes, which will be set into the holes later with putty.)

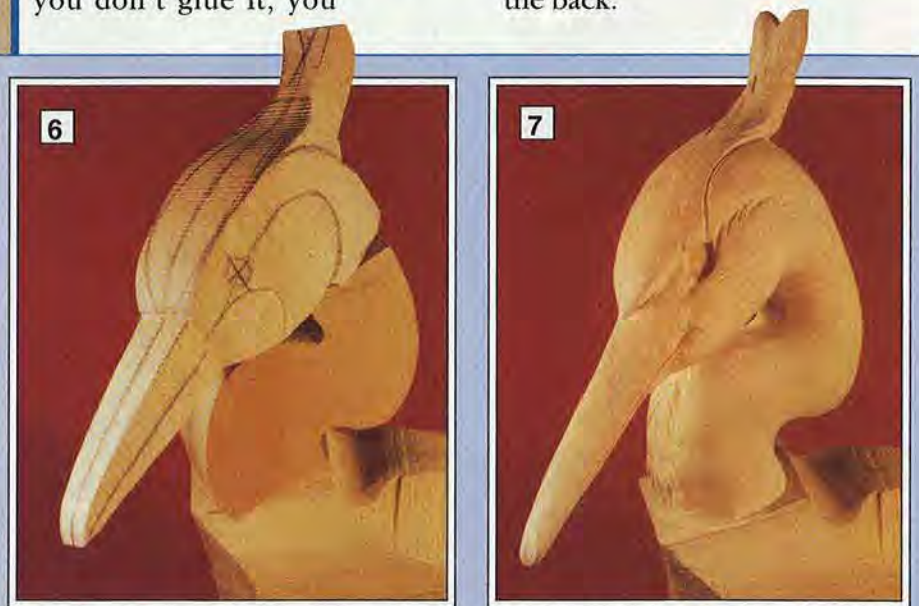
Glue the neck to the body, if you wish. (You may not want to glue it. Many early hunters made their decoys in two parts for ease of storage and transportation. And if you don't glue it, you can turn the head to the position that best suits the display location. If your heron will be outside, you should glue the neck on.)

Hint at some feathers

At this point, completing a primitive-style decoy, or *slick* as hunters used to call them, only requires carving a few major details. "Generally, I shape major feather groups on the body without texturing individual feathers, merely giving the hint of a feather outline here and there," Frank explains. "Then, when I paint, I outline representative feathers and quills with brush strokes."

Study Photos 8 and 9 and the photo of the completed carving to see the feather groupings. Sketch in the lines for the feathers in the wing groups. Vary feather sizes slightly for a more natural look.

Begin carving the group highest on the heron's back. Carve a slight relief along the feather line, then round the edge. Within each layer, the feathers overlap from the middle of the back outward. Each group lays over the next one down. The overlap can be subtle—a break of 1/16" or less defines the layers adequately. Note, too, the softness of the trailing edge of each layer. Groups should blend rather than stairstepping down the back.



6, 7 Draw guidelines on the head prior to carving. V-cuts along cheek and jowl lines represent feathers on the head.

Curved feather-like lines carved from the body onto the front of each wing suggest body feathering. Here, you could carve and texture body feathers and texture the wing groups for a more detailed carving. But for a slick, the smooth surface will be fine.

Lay out and carve the tail feathers as you did the wing groups. The tail feathers, too, overlap from the center outward. Carve the chest plumage next. The desired effect here is a ruffle of fluffy feathers—much like the feather boa so often seen draped around the femme fatale's shoulders in an old movie.

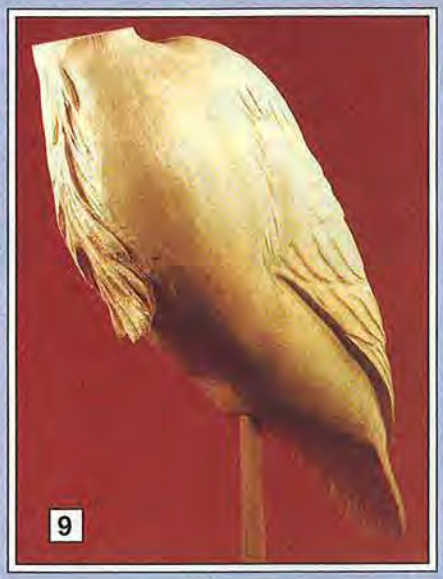
Now, set the eyes. Mix a small amount of epoxy putty (available at hardware stores). Roll it into a ball, and push it into the eye hole. Then, press an 11 mm yellow glass eye into the putty until the eye protrudes about 3 mm from the side of the head. Trim off the squeezed-out putty. Roll that into a strand about 1/16" in diameter, and wrap it around the eye to form the eyelid. Model the eyelid, following the drawing. After the putty dries, sand off any bumps or lumps. Mask the eyes for painting.

To burn or not to burn

Before you start painting, decide whether you want to blast your carving with a propane torch. Why would you even consider doing that? To make it look old.

One aging or distressing technique involves rubbing the paint off in certain spots, giving the carving a well-worn look. Burned wood looks old and weathered when revealed this way. Don't overdo it, though. Aging a few spots by burning will give your carving patina and charm; too much will give it the look of something that you dragged out of a campfire. Look at the carving; you'll be able to tell where the paint would rub off during storage, transportation and use. These are the areas to burn.

You can burn the surface lightly, creating a toasty color, or more



8, 9 Some feathers are delineated on this decoy-style carving, others are suggested by the flame-like lines carved at the front of the wings. You could detail the bird further by texturing the feathers.

heavily, blackening the wood and raising the grain. After burning a spot, Frank removes charred wood with a stiff brush.

Add realism with paint

To paint the heron as shown, you'll need artist's acrylics (available from art-supply dealers) in these standard colors: Titanium white (TW), Paynes gray (PG), Mars black (BL), raw umber (RU), yellow ochre (YO), and burnt sienna (BS). Either tube or liquid colors will work; liquid ones don't require as much thinning.

Sand the carving and seal it with shellac before painting. Prime the carving with a coat or two of white acrylic gesso (also available at art-supply stores). Mix a little PG into TW for the base coat, and paint the entire bird.

Darken the base gray with a touch of RU to paint the tail and the primary feathers of the wing (the ones that extend farthest back over the tail). Paint the top and bottom of the tail with the darker color.

Add a bit of RU to TW for the cheeks, jowls, and the top of the head. Bring the same ivory color down the back and sides of the neck, blending into the gray.

Paint the chest plumes the same TW/RU color. Tint some MB with RU, then use that color and TW to highlight the chest plumes. Paint highlight lines randomly along the edges and centers of the wing feathers—but not every feather.

For the shoulder patch, tint BL with RU. Add a spot of BS at the upper edge. Paint the tip and underside of the bill YO, blending into BL and RU on the top.

Age the painted carving

Let the paint dry thoroughly before distressing and antiquing the heron. Then, using 0 or 00 steel wool, rub through the paint in the areas you burned previously, or down to the bare wood if you didn't do any burning. Leave random, feathered edges, as if the paint had been worn off by years of rough handling and storage in burlap bags. You could also dent or scratch the wood and, if you're really brave, break a piece off the bill, chest plume, or some other vulnerable spot.

To antique the distressed carving, thin RU with water to an inky consistency. Wash coats of it all over the carving, allowing it to puddle in depressed areas and carved features—places where dirt would build up. Don't let runs create streaks on the smooth parts of the carving—blot them off with a towel. Also wipe the antiquing away in some high spots to create highlights. Let dry, then repeat the process until you achieve the look you want.

After the antiquing dries, sign the carving on the underside of the tail. Then, apply furniture wax. Let it set according to the manufacturer's instructions, then buff it (Frank puts an old athletic sock on his hand to do this). Buff the high spots, but don't try to get down into the depressed areas.

Build the base

To construct a stand like the one shown, draw a 9"-diameter circle on 2"-thick stock. Laminate thinner stock, if necessary.

Tilt your bandsaw table to 45°. With the workpiece on the low side of the table, saw around the circle. Drill a ½" hole 1½" deep centered on the top surface—the smaller face.

Texture the beveled sides and top with shallow, random grooves. Cut a 20" length of ½" dowel rod. Chamfer the ends to fit into the holes in the stand and heron. Mix a bit of RU into MB to paint both parts. Place the completed carving on the stand.

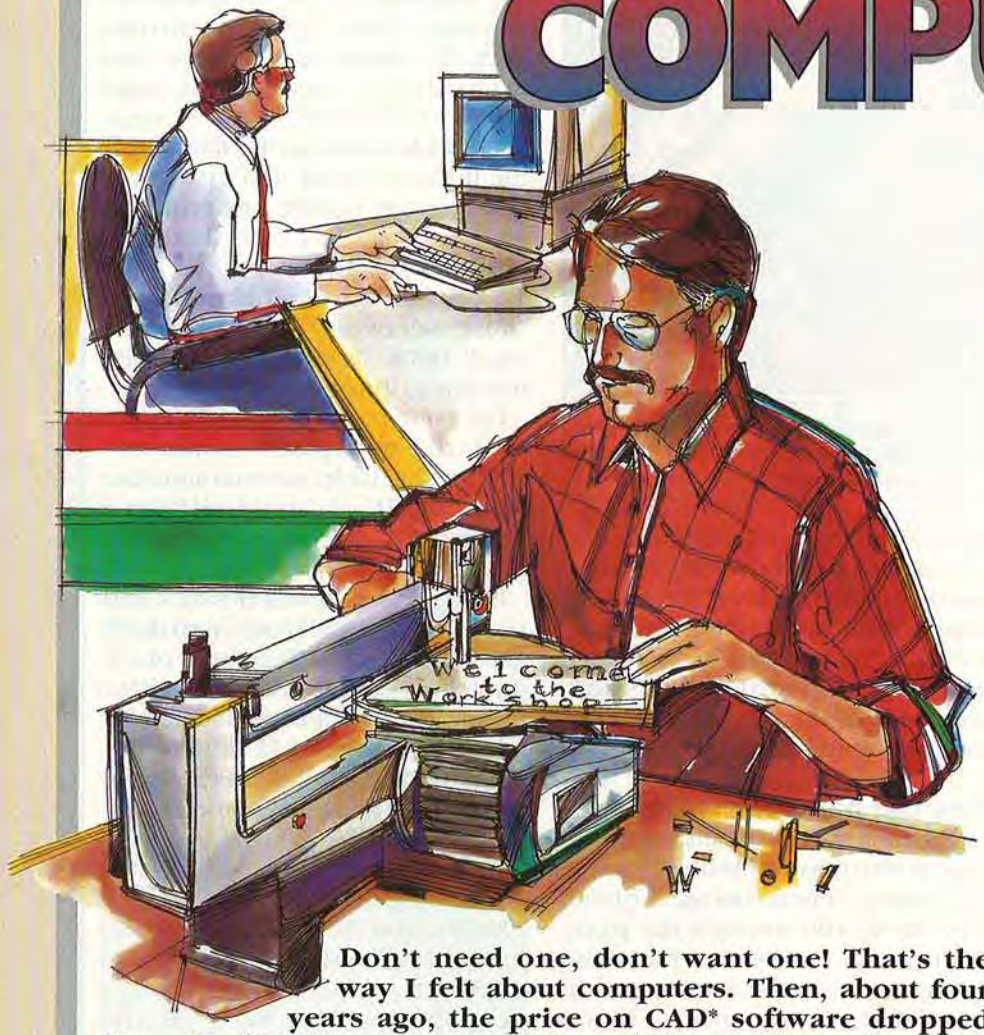
Buying Guide

Carving blanks. Full-scale basswood blanks cut both ways, leg dowel, and base for S-neck great blue heron, the project shown here. $27 ppd. in U.S. Also in straight-neck pose, same price. Half-scale blanks, either S-neck or straight-neck, $22. All available as heron or American white egret. Roaring Brook Woodcarving Kits, P.O. Box 1402, Glastonbury, CT 06033, (203) 657-8976.

Books, classes. Frank Russell power-carving books: Vermont Folk Figures, $9.95; Realistic Faces, $12.95; Realistic Animals, $12.95; Folk Figures, $12.95. Books, as well as information on classes and seminars, available from Stonegate Studios, 5 Russell Road, Box 2140, Cambridge, VT 05444, (802) 849-6692.

Project Design: © Frank Russell
Photographs: Frank Russell; Hopkins Associates
Illustrations: Roxanne LeMoine

HOME COMPUTERS 7 ways they can help



Don't need one, don't want one! That's the way I felt about computers. Then, about four years ago, the price on CAD* software dropped from the $3,000 range to as little as $150. Not long afterward, online services* started covering woodworking tips, techniques, and tool talk.

So I bought a home computer and went to work with Jim Downing, our design editor and a fellow computer enthusiast. We discovered lots of uses and techniques that we will introduce you to in this article. If you want to just dabble, you can try our scrollsaw sign-making method with a word-processing program*, subscribe to an online service, or try the single-purpose software* we found. And should you want to dig deeper into the digital woodworking universe, check out our report on CAD and drawing programs starting on *page 82*.

If you don't own a computer, read "What to look for in a home computer" on *page 83* first. If you already own one, you can skip this section, grab your mouse*, and get started.

** If you run into a word that you don't understand with an asterisk by it, check out the definitions on* page A-45 *in the boxes titled "Terms of the trade," or "What to look for in a home computer."*

Print this article

Tom Jackson
General-Interest Editor

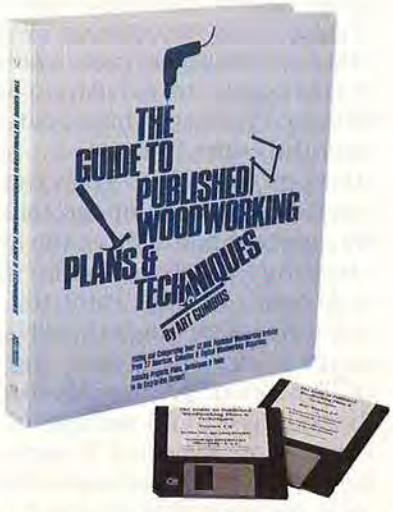
1. Create letters for scrollsawn signs and plaques

All you need to make letter patterns for your scrollsaw projects is a computer with a word-processing program and a printer. Word-processing programs offer dozens of type "fonts" (styles) that can be scaled to almost any size.

To create a letter pattern, you simply type the letters, then experiment by changing the font, size, and spacing between the letters and lines. When you've got the look you like, print the results and adhere the paper to the wood to be cut.

2. Locate thousands of woodworking articles

Thumbing through the back issues of woodworking magazines can eat up a lot of time. If you have a computer, however, you can install a program called "The Guide To Published Woodworking Plans" and gain instant access to listings of 15,800 articles from



When you plug the software for "The Guide to Published Woodworking Plans and Techniques" into your computer, you can research articles from 27 woodworking magazines.

27 woodworking magazines dating back 20 years. Published by woodworker and computer buff Art Gumbus, the Guide, shown *below left*, indexes articles in 37 different categories such as accessories, cabinets, jigs, routers, sanders, and so on. Art also publishes a book version, but the software contains a cross-index function that allows you to search for techniques in project articles.

The disk by itself (DOS*, or Macintosh* versions) runs $20. The book and the disk together cost $37. The book alone is $25. To order (specify PC or Mac), write to: KnotWhole Publishing, 5629 Main St.-Putney, Stratford, CT 06497. You can also contact Art via E-mail* at: America Online: ArtGumbus, or CompuServe: 76600,1176.

3. Calculate almost any compound miter

Years ago, woodworker Carl Shafer ran into a problem calculating the compound angles for a toy windmill he was building. So he looked up the mathematical formulas and put them into a Windows-based program.

To use Carl's Miter Calculator, simply type the number of sides you want, the slope, height, and width of the top or base into the appropriate boxes on your computer screen. The program will figure your miter-gauge angle, saw bevel angle, and their complements as shown on the computer screen *above right*. If you have a printer, you can print a paper template of the bevel angle and use this to set up your sawblade.

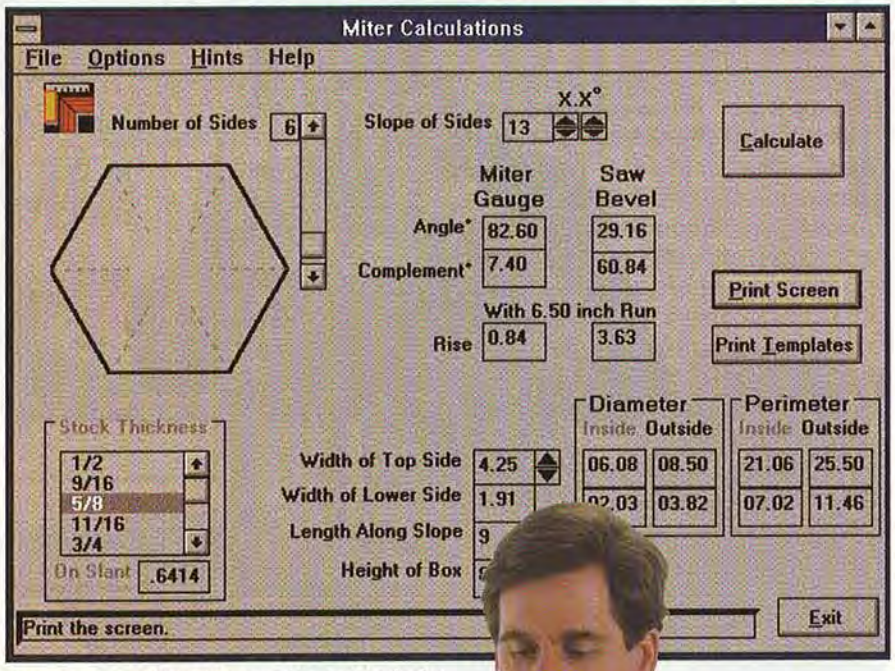
The Miter Calculator will figure angles for staved bowls, picture frames, shadow boxes, and tapered columns. The program is available through America Online as shareware*. To find Carl's program, type "MITER" in the America Online keyword section. The fee for downloading Carl's program is $25.

4. Surf the online services and write to *WOOD*®

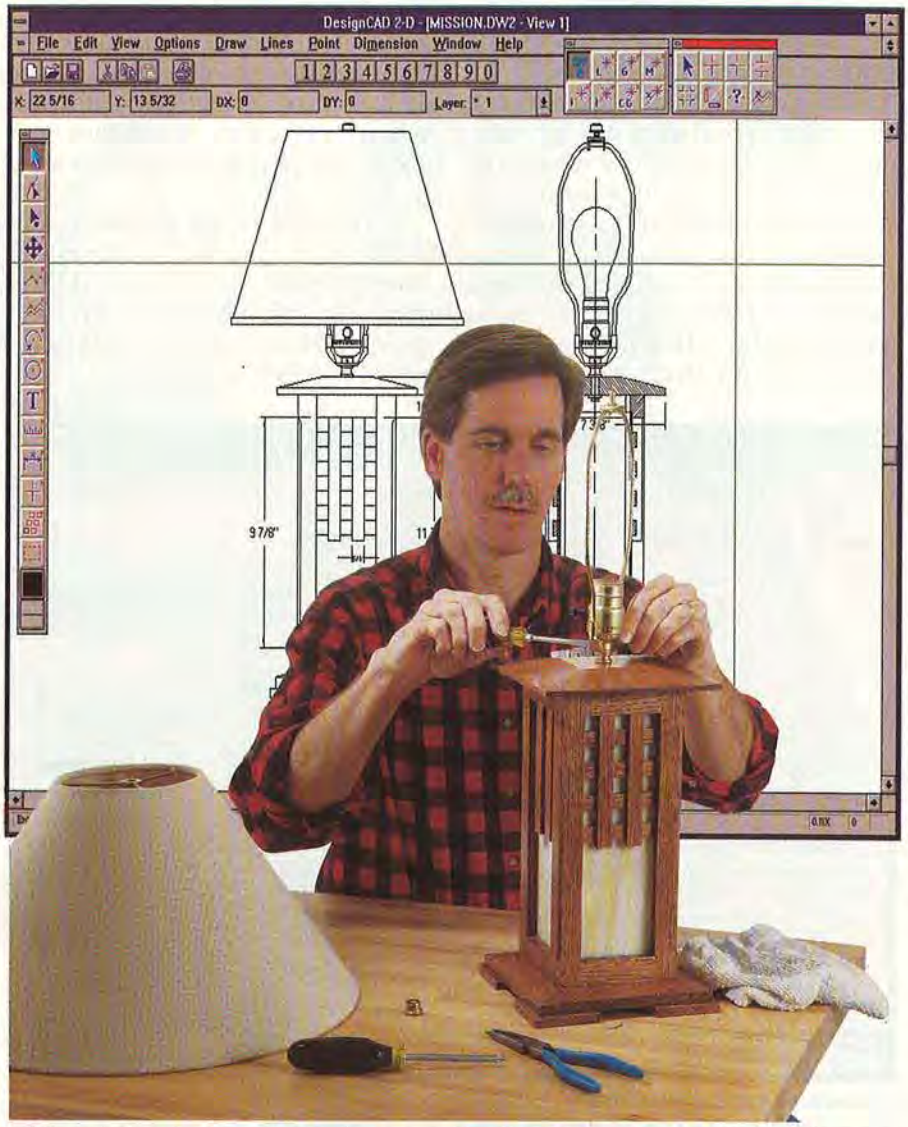
Have you ever wanted to ask a group of woodworkers a question, or write a *WOOD* magazine editor and get a quick response. With a computer and a modem* you can do just that using CompuServe, Prodigy, America Online, and other services. For a fee of roughly $10 a month, these services offer the text of many current magazines and newspapers, software to download (some of it free of charge), and forums where you can communicate with other special interest groups such as woodworkers.

If you want to get in touch with *WOOD* magazine editors in CompuServe, our E-mail address there is: 74404,3516. To find out more about CompuServe, call 800/848-8990.

Continued on next page



Do compound miter angles overwhelm your math skills? The Miter Calculator program figures the hard part for you. All you need to input is the height of the project, the number of sides, the slope, and the width of the top or base.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With a CAD program you can draw and dimension every aspect of a project right down to the hardware.

5. Draw your own projects with a CAD program

Anybody who has designed a woodworking project with paper and pencil knows how bothersome it is to make changes. With a CAD program, you draw on screen, just as we do to design projects such the lamp *above*. To draw different lines (straight or curved) or different shapes (rectangular or circular) you simply choose a different drawing "tool" from the "toolbox" located at the top or side of the screen.

The beauty of CAD programs is their ability to rotate, copy, shrink, enlarge, color, and make duplicate or mirror images of anything you draw—all this with a few clicks of your mouse. You can tweak designs until you get the proportions you like, or modify multiple copies for comparison. You can even make up your own cutting diagrams by copying project parts onto an outline drawing of the available lumber.

With CAD you can quickly measure and draw dimensions. And you get all the standard architectural scales, English and metric, in a range from 10X magnification to 1" equals 1-mile.

Below, we've listed some features to keep in mind when shopping for a CAD program, and on *pages 82-83* we review six popular CAD programs we've tried. Unless otherwise noted, all the CAD programs reviewed include the features listed here.

Tutorials. If you've never worked with CAD before, shop for a program with a tutorial (a short introductory study of the program's features). Many of the software manuals start with a tutorial, but some programs offer an even more useful feature—a self-guided tutorial that runs on the computer screen. Some companies also provide a video to preview functions on your TV.

Symbol libraries. To speed up the drawing of commonly-used elements, most CAD programs offer a symbol library with predrawn shapes. Many of these symbols, however, are geared for architectural, mechanical, or landscape work. As a woodworker, you should look for a symbol library that allows you to create your own custom profiles, such as hardware shapes, cabriole legs, and router-bit shapes.

DXF import/export function. To download project drawings from another computer or an online service, you will need a CAD program that contains a DXF (drawing exchange format) function. This will also allow you to share your drawings with other computer users.

Spreadsheets and databases. Architects and professional designers use spreadsheets and database functions in CAD programs to extract information from the drawings. This allows them to create a bill of materials and track costs for each project. This may prove valuable if you do woodworking for hire or big projects such as kitchen cabinets.

6. Get creative with a drawing program.

CAD programs excel at straight-line drafting and some curves. But if your woodworking tastes lean more to scrollsawing, sign making, or projects that incorporate pictorial designs, you may want to choose a drawing program.

As shown in the hummingbird sign *below* you can wrap, slant, or skew letters and other figures around any shape with a drawing program. And most drawing programs come with hundreds of clip art profiles—shapes and patterns that you can use, modify, or build into your own designs.

All-purpose software programs (such as ClarisWorks or Microsoft Works) include a basic drawing program. Once you become familiar with these, you may want to step up to a fully-featured drawing program. The two most widely used programs include Claris-Draw, for Macintosh users, and Corel Draw for PC* users.

To find out more about these drawing programs contact: Claris Corporation, 5201 Patrick Henry Dr., Santa Clara, CA 95052; call 408/727-8227). Or write to Corel Corporation, 1600 Carling Ave., Ottawa, Ontario K1Z 8R7; call 613/728-8200).

A drawing program enables you to create full-color pictorial images on screen for use in scrollsaw projects, carvings, and signs.

The WoodMatch program allows you to search the globe for the right wood.

7. Search the forests of the world for the right wood

If you've ever wanted to substitute one wood for another, but didn't have enough information, check out WoodMatch. Compiled from data in hundreds of books, WoodMatch contains information on more than 300 species of tropical and temperate trees.

WoodMatch comes on a CD-ROM* or floppy disk, and you can conduct searches based on properties such as strength, weight, or hardness. Want a wood that bends like hickory? Look up the information on hickory, plug the bending data into the "Criteria Search" window, and the computer will find every wood with the same bending characteristics.

As a database, the program allows you to input your own information. Additionally, you can look up data on 300 wood-composite products such as particleboard and plywood.

You may also find useful the the environmental profiles contained in this program. These profiles highlight species that are endangered or logged destructively, and then lets you search for better choices.

WoodMatch is available in PC or Mac versions for $39. You can also get a professional version containing additional technical information for $249. For information or orders contact: Tree Talk, Inc., P.O. Box 426, 431 Pine St., Burlington, VT 05402. Call 800/858-6230.

Continued

HOME COMPUTERS

CAD PROGRAMS FOR WOODWORKERS

The following is a listing of the CAD programs we've sampled that offer features woodworkers can use. We've listed manufacturers' suggested prices. Shop around and you should be able to find most of these programs at lower prices.

3-D programs

DesignCAD 3D 5.0
This program comes in DOS and Windows versions. (We've used the company's 2-D/Windows program to make the drawings at *WOOD* for years.) The 3-D version, though, gives you both wire-frame and solid modeling capability. With the solid modeling you can create photorealistic images. The program's "Boolean" operations use one drawing to cut, carve, or drill into another drawn object. $499. (The company also sells a 2-D/3-D Macintosh version for $299.)

American Small Business Computers, One American Way, Pryor, OK 74361. Call 800/233-3223.

MiniCAD 6.0
With this Macintosh program you can switch easily between 2-D and 3-D modes. If you like a blueprint look to your screen, you can turn the background black and render lines and text in white. In the tool box you'll also find rotation, walkthrough, and flyover functions which show you projects from different perspectives. This is an in-depth program—the tutorial alone runs over 200 pages. The company also sells a Windows version called Graphsoft CAD. $795.

Graphsoft Inc., 10270 Old Colombia Road, Suite 100, Colombia, MD 21046. Call 410/290-5144.

2-D programs

Drafix CAD
This Windows-based program lets you see four views of a project simultaneously. When changes in a dimension are made in one view, the other three views instantly incorporate that change. A CD-ROM included in the package contains more than 5,000 symbols. The program allows you to create and customize tool boxes, and comes with a helpful manual. A tutorial is available on request. $495.

Softdesk Retail Products, 10725 Ambassador Dr., Kansas City, MO 64153. Call 800/231-8574.

Dyna Designer
Billed as both a drafting and drawing program, this software package offers 2,000 commands. These can be activated by typing in a text command or moving a cursor across the Windows screen icons and menu bars. An overview window allows you to study the on-screen drawing in miniature. Drawings can be scaled to 16 decimal points for precision. You can create up to 256 layers within a program, and open and work on as many drawings as you can fit onto the screen. The program comes with a thorough tutorial and an 800-page manual. $399.

Ditek International, 2800 John St. #15, Markham, Ontario L3R 0E2. Call 905/479-1990.

Terms of the trade

CAD (computer-aided design) programs help you use a computer screen as a drafting board.

Online services connect home computers to one another and to vast banks of information.

Word-processing programs allow you to write, cut, paste, size, and rearrange text.

Megabyte: a million bytes. (A byte is a unit of information roughly equivalent to ten typewritten, single-spaced pages.)

Shareware programs are downloaded from the online service to your computer.

Modems connect your computer via your telephone lines to other computers and the online services.

E-mail is a message or letter sent via modem from one computer to another.

Mouse: a hand-held device that lets you move a cursor around on your computer screen.

Turbo CAD
This program comes at a modest price with lots of customizable features and is available in Windows and Macintosh versions. The tool palate leaves plenty of screen room for drawing—an important point if you are working with a 14" screen common to most home computers. As you move over the different drawing tools, a label on the cursor names the tool and a corresponding box at the bottom of the screen gives you more in-depth information about the tool or icon. $150.

IMSI, 1895 East Francisco Blvd., San Raphael, CA 94901. Call 800/833-4674.

MacDraft 4.1
For Mac users, this program uses floating palettes on the screen that can be moved or hidden to keep your screen clutter free. Installation is quick and requires only one disk. The tutorial proved useful and the integrated database can be transformed into a MicroSoft Excel worksheet. A linear duplication feature allows you to instantly make rows of columns or features. $449.

Innovative Design Data, Inc., 1820-L Arnold Industrial Way, Concord, CA 94520-5325. Call 510/680-6818.

What to look for in a home computer

First, let's define terms. The computer is generally referred to as hardware. This includes the screen, keyboard, mouse, and CPU (central-processing unit) which contains the "brains" of the computer. Software comes on floppy disks that you insert into the CPU. Each software program contains information to help you perform specific tasks such as write, draw, or play games. You can also get CD-ROM software which contains much more information than floppy discs. To read these, however, your computer must have an external or built-in CD-ROM drive.

You'll find two basic choices in home computers: PCs (personal computers) or Macintosh (Mac) computers. Most PCs work in tandem with a user-friendly software program called Windows which replaces the clunky DOS (disk-operated systems) of the past.

The critical difference is that most software programs are written for just one type of system. You don't want to buy a Mac only to find the software you want comes in a PC version.

You'll also want to make sure that your computer has enough RAM (random-access memory) to support the software you want to use. Most home computers today come with 4MB (megabytes) of memory which is plenty for most tasks. But some drawing and CAD programs require up to 5MB. So identify what you intend to do with a computer first, find the software that will do it, and then choose the best computer to support the software.

Finally, do your homework. Study the books and magazines geared for beginning computer users. Ask a friend with a computer for advice, and if possible, log a few hours of practice on their machine.

Recommendations

For most home woodworkers and small shops, Drafix CAD, Dyna Designer, and MacDraft 4.0 will do well. If you are new to computers or CAD, however, a low-cost program like Turbo CAD will serve most of your needs without costing a lot.

If you want to study projects in three dimensions or create color renderings, choose one of the 3-D programs such as Design CAD 3D, or MiniCAD. Keep in mind that 3-D programs require more computer memory and take longer to master than 2-D.

Stay away from the "architectural" drawing programs you see in the stores or catalogs for under $50. These are fun programs to play with, but about all they do is allow you to manipulate preset room and landscape layouts. If a program doesn't say "CAD" in the title or description, then it probably won't give you the functions you need to draw woodworking projects.

Written by Tom Jackson. Technical consultant: Jim Downing.
Photographs: Hopkins Associates, King Au, John Hetherington

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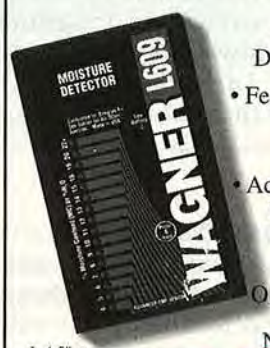

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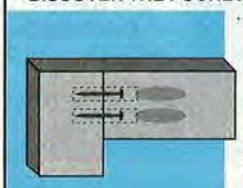

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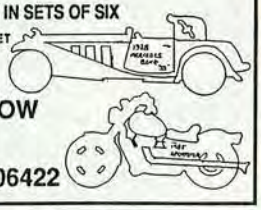

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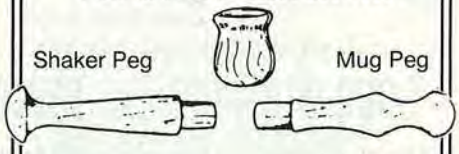

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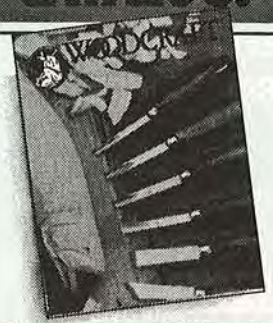

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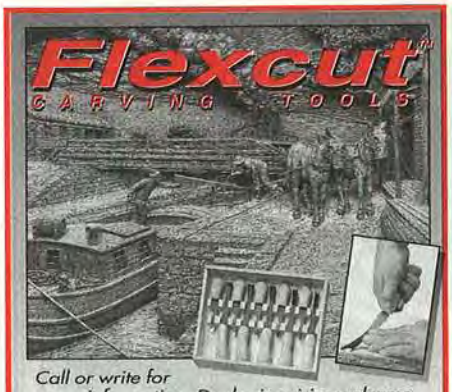

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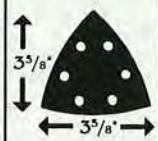

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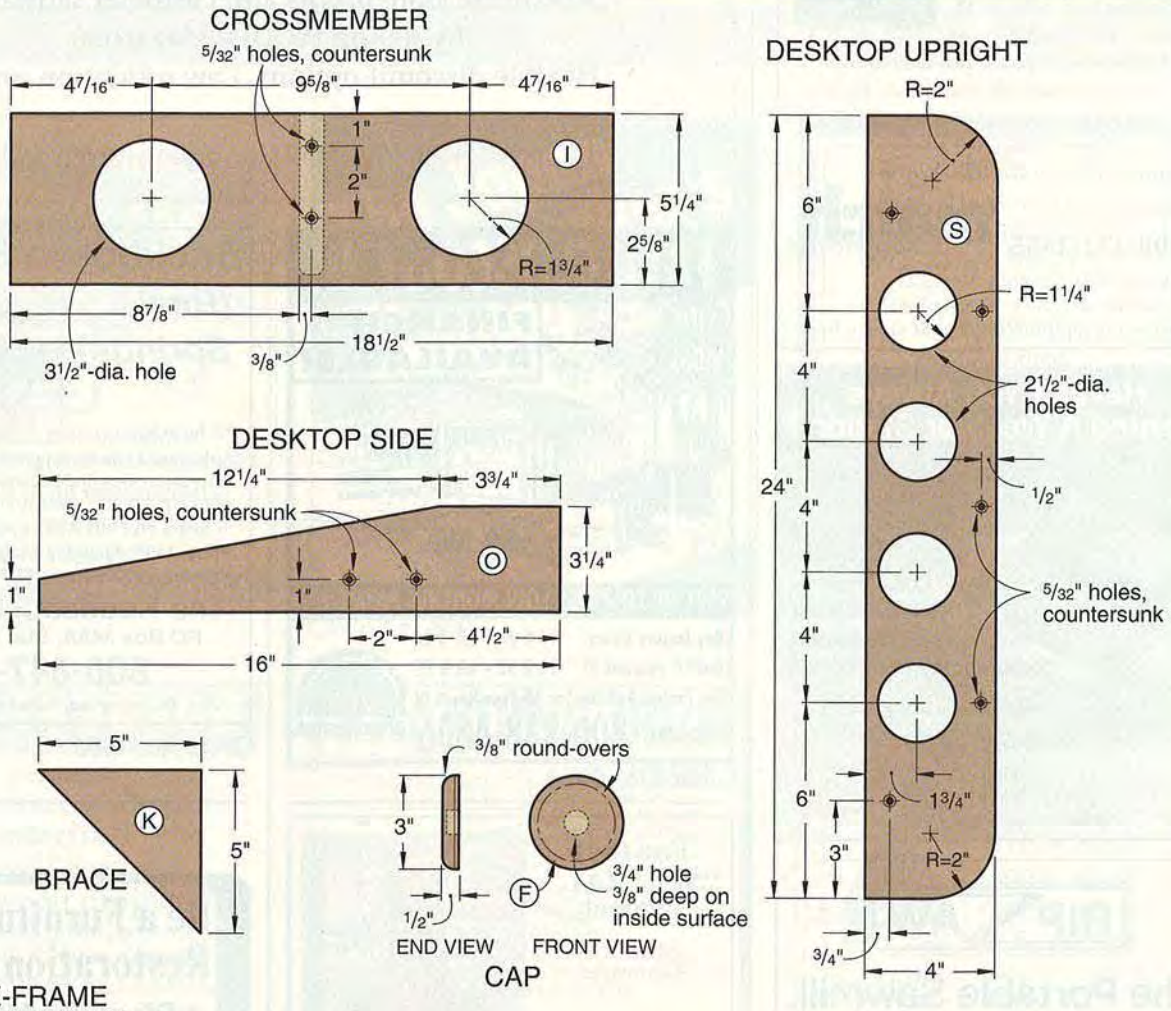
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5/32" holes, countersunk
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31/2"
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13/4"
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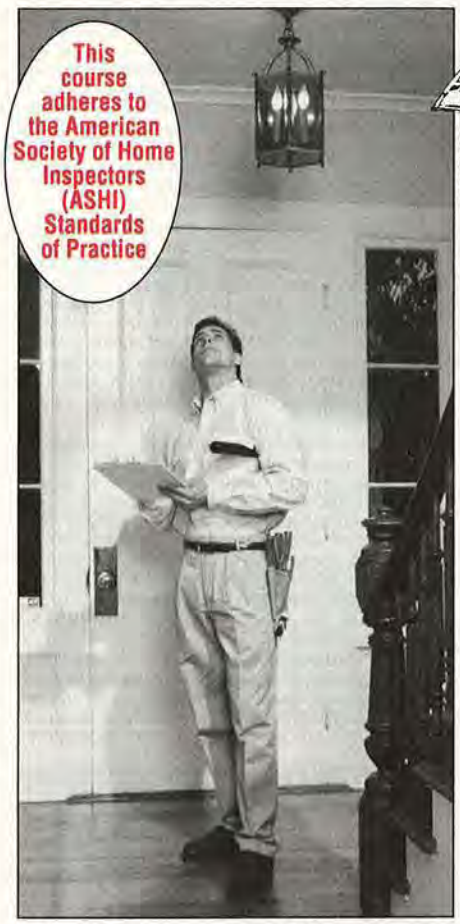

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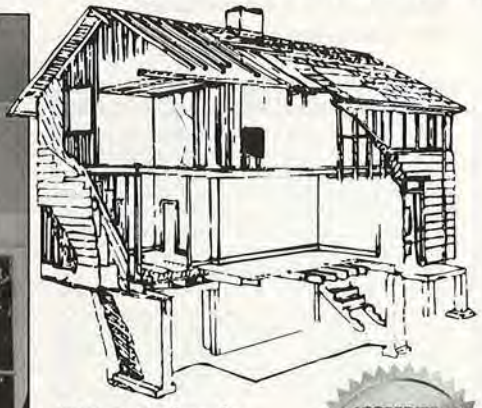

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DW443	6" ROS SANDER VAR SP, VELCRO	139
DW444	SAME AS ABOVE WITH PSA PAD	139
DW610	1 1/2 HP ROUTER, 9 AMP	148
DW615	1 1/4 HP PLUNGE ROUTER, VAR SP	164
DW625	3 HP HVY DTY PLUNGE RTR, VAR SP	275
DW670	*NEW* LAMINATE TRIMMER WITH GUIDE	97
DW682K	BISCUIT JOINER KIT	219
DW935	14.4V TRIM SAW	146
DW935K	14.4V TRIM SW KIT W/BAT, CHRGR, CS	239
DW935K2	DW935K WITH 2 BATTERIES	259
DW972K2	*NEW* 12V CRDLS KIT/W BATTERY & CASE	188
DW991K	14.4V CRDLS KIT W/BATTERY & CASE	199
DW991K2	DW991K WITH 2 BATTERIES	218

DEWALT HOLIDAY BONUS SPECIAL

DW972KS-2INCLUDES DW972 12V CDLS DRILL, DW930 CORDLESS SAW, 2-12 VOLT BATTERIES, CHARGER & CASE 274

DW991KS-2INCLUDES DW991 14V CDLS DRILL, DW935 CORDLESS SAW, 2-14.4 VOLT BATTERIES, CHARGER & CASE 349

Vem

SUPER SPECIAL! $188
636 OSCILLATING TRIANGULAR SANDER
INCLUDES CASE & PAPER ASSORTMENT

SENCO

SLP20	BRAD NAILER W/CASE 5/8"-1 5/8" CAP	278
SFN40	FINISH NAILER 1 1/4"-2 1/2" CAP	396
SLS20	1/4" CRWN STAPLER, 3/8"-1 1/2" OILESS W/CS	258

RYOBI

AP12	12" PORTABLE PLANER	388
BT3000SX	10" TABLE SAW W/FREE STAND	529
DC500K	DC500 KIT W/CASE & 5 PC CHISEL SET	65
DS2000K	2 SP DETAIL SANDR W/CS & 12 PC AST	65
HT20VSK	MULTI ROTARY TOOL W/CS & 101 PC AST	57
ML618	18" WOOD MINI LATHE	209
OSS450	OSCILLATING SPINDLE SANDER	156
SC162VS	16" VS SCROLL SAW	164

Milwaukee

0407-1	12V KYLS CDLS DRILL KIT W/2 BAT, CS	174
6490	10" MITER SAW	264
6494	10" CMPND MITER SAW W/CARB BLADE	322
6507	VAR SPD SAWZALL W/BLADES & CS	144

freud

TR215	8 1/2" SLIDE COMPOUND MITER SAW	369
JS100	BISCUIT JOINER $164 (AFTER REBATE	134)
FT2000E	3 hp ROUTR W/EDGE GUIDE AFTER REBATE	185
EB100	EDGE BANDING SYSTEM	208
EDS132B	13.2V CRDLS DRILL KIT W/2 BAT	209
F410	10" X 40T QUIET BLADE	49
F810	10" X 80T QUIET BLADE	74
LM72M010	10" X 24T FLAT TOP RIP BLADE	36
LU82M010	10"X 60T CROSSCUT/RIP BLADE	45
LU84M010	10" X 50T ATB COMBO BLADE	40
LU85M010	10" X 80 T ATB FOR MIRROR FINISH	58
LU87M010	10" X 24T RIP BLADE THIN KERF	39
LU88M010	10" X 60T CROSSCUT THIN KERF	45
LU89M010	10" X 72T TCH NON FERROUS METAL	57
LU92M010	10" X 80T TCH - BEST FOR LAMINATES	59
LU98M010	10" X 80 T TCH LAMINATES OR WOOD	67
SD308	8" SAFETY DADO WITH CASE	116
SD508	*NEW 8" SUPER DADO SET*	168
94-100	CABINET DOOR SET	158

Advanced-design screws saw into wood

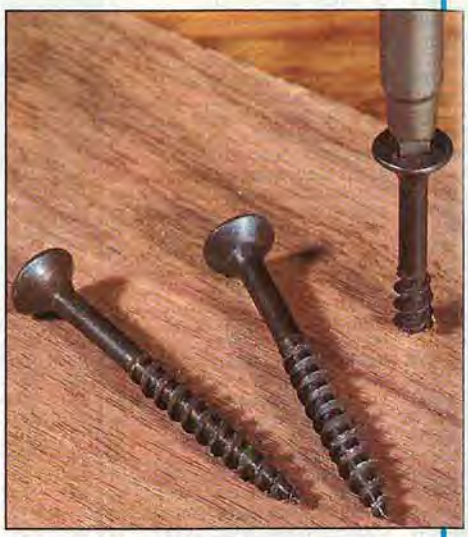
Most of us don't give much thought to the quality of the screws we use—until one snaps off inside a workpiece. With the proliferation of low-cost, general-purpose "drywall screws," the failure rate in wood runs high.

To prevent breakage, Häfele introduced Spax-S Screws, a product with a hardened-steel core and several other features that put them a notch above any other screw I've tried. The threads on the lower third of the Spax-S Screw have small serrations that cause the screw to "saw" down into the wood as you drive it. This sawing action reduces the splitting that occurs when ordinary non-serrated threads split or push aside the wood fibers. And the self-tapping tips of these screws bite into the wood easily so that you don't have to push down hard or drill a pilot hole to get the screw started. On the head of the screw, a combination recess accepts square-drive or Phillips-head driver bits. Additionally, a low-friction coating on the screw helps to reduce the effort it takes to sink the screws.

To find out how much abuse these screws can take, I drove a dozen of them into 1"-thick pieces of oak and walnut without pilot holes. In every case, the screws pulled themselves clear through the wood without snapping off. The only splitting I encountered was when I screwed too close, within an inch or so, to the edge of a board.

A box of 1,000 Spax-S Screws costs about 50% more than the least-expensive drywall screws. But I think that these screws are worth the extra cost for any home woodworker who doesn't want to risk digging out or covering up a broken screw.

—Tested by Dave Henderson



PRODUCT SCORECARD

Spax-S Screws

Performance	★ ★ ★ ★ ★
Price	About $12 per box of 1,000 #8x1¼" screws
Value	★ ★ ★ ★ ☆

Häfele America, 3901 Cheyenne Dr., P.O. Box 4000, Archdale, NC 27263. Call 800/423-3531.

Set knives in seconds with the Planer Pal

Resetting the knives on a planer can frustrate even patient and careful woodworkers. The knife-setting gauges that come with most machines will only get you to within about .005", and that's still just a bit too much error for a smooth cut.

The Planer Pal is designed to set knives on most of the popular models of 10" and 12" planers with 1⅞"-diameter cutterheads. It consists of two separate plastic shells, each with five magnets and an indexing pin on the concave underside of the shell. Four of the magnets hold the shell to the cutterhead. The fifth magnet sets the height of the blade.

To use the jig, set your knives loosely in the cutterhead, and place the shells on opposite ends of the cutterhead with their indexing pins pushed against the back edge of the gib slot. Adjust the knife until the center magnets just touch the knife edge. Now, tighten your bolts and repeat the operation on the rest of the knives.

When I used the Planer Pal, I was able to set the height of each knife on my planer to within .001" end-to-end and their height to within .002" difference from knife-to-knife. That's accurate! I recommend the Planer Pal to anyone who owns a planer and wants to keep the knives aligned.

—Tested by Bob McFarlin

PRODUCT SCORECARD

Planer Pal

Performance	★ ★ ★ ★ ★
Price	About $35
Value	★ ★ ★ ★ ★

Woodstock International Inc., P.O. Box 2309, Bellingham, WA 98227. Call 360/734-3482.

Continued on page 100

Santa
(4" Height)

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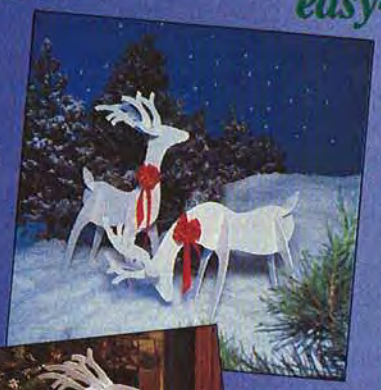
Holiday Cutouts Grace the Season

Decorate the season with these easy-to-build holiday cutouts.

Christmas Tree
(6' Height, 4'6" Diameter)



Large
Reindeer
(3' W x 4' H)

Decorate your yard and home with these impressive holiday cutouts. Build them yourself for years of enjoyment, and a sense of pride and accomplishment. Full-size patterns and complete step-by-step instructions make each of these holiday decorations easy to build! Only a few tools and an evening or two are needed for each project. For professional results, just follow the simple cutting, painting and assembly instructions. It's as easy as that! Plus, when the season's over, disassemble and lay the pieces flat for space-saving storage. To assure your success, the experts at *WOOD®* magazine designed and built each project.

Med./Small
Reindeer
med. 28"
Height, sm.
9" Height)

How to order

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Sleigh
(56" L x 35" H)

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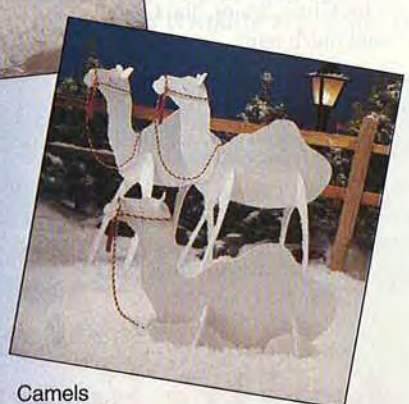
Wise Men
(50 1/2" Height)

Angels (4' Height)

Nativity Scene
(Mary 32 1/2" H, Joseph 45 1/2" H)



Camels
(4' Height)

100% money-back guarantee if not completely satisfied.

SHOP TESTED

PRODUCTS THAT PERFORM

Continued from page 98

B&D adapts the Workmate to a portable tool box

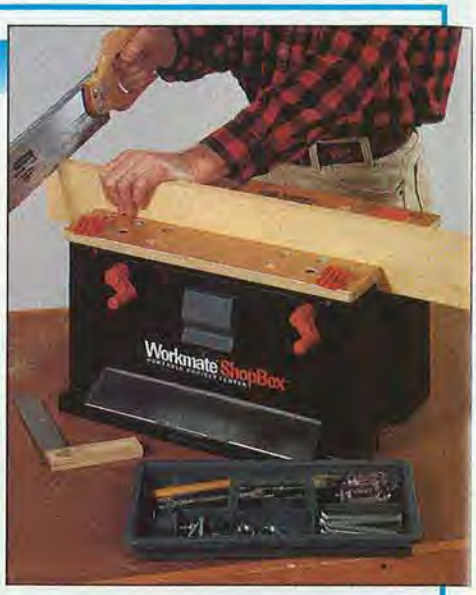
When working away from the shop, I usually haul my tools around in a 5-gallon drywall bucket. But unless I drag clamps and sawhorses up from the basement, I lack an on-site means to clamp or hold a workpiece steady. The Black & Decker ShopBox, a hybrid of the Black & Decker Workmate and a portable tool box, solves these problems.

Like the Workmate, the 11×18" top of the ShopBox has two jaws that open and close to clamp workpieces. And it offers swiveling benchdogs that you insert in holes in the top and use to hold workpieces up to 11½" wide.

Below the hinged top, the ShopBox contains a tool-storage area that includes a portable tray for small odds and ends on the top, and a 9×15×7" storage well below. I managed to fit an electric drill, jigsaw, 20'-extension cord, and a few hand tools in it. At the bottom front edge of the ShopBox, another shallow plastic tray contains three small bins covered with a plastic lid. These each hold a small handful of nails, screws, or hardware parts.

Compared with the Workmate, I found the vise handles on the ShopBox too close to the top—a sacrifice made to conserve space and keep the unit portable. But that's the only difficulty I experienced. I still tote the bulk of my tools in a drywall bucket, but by carrying the ShopBox in the other hand, I've got a portable workbench and clamp that eliminates the biggest hassle of working away from the shop.

—Tested by Tom Jackson



PRODUCT SCORECARD

Black & Decker ShopBox

Performance	★ ★ ★ ★ ☆
Price	About $50.00
Value	★ ★ ★ ★ ☆

Write to: Black & Decker Consumer Services, P.O. Box 618 Hampstead, MD 21074. Call 800/762-6672.

Continued on page 102

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3X18	.86 ea	4X36	1.35 ea
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Circle No. 1229

Natural Prostate Relief

It's a natural fact. If you are a male over 40 and don't already suffer from a prostate gland disorder, the odds are 2 to 1 that you will before you are 59. By the age of 65, most American men have enlarged prostates.

As the years pass, mild discomforts can become disabling. Today, prostate surgery is the second most commonly performed surgery in men over age 65! Surgical complications can include total loss of bladder control and sexual dysfunction.

Prescription drugs may halt the swelling, but rarely end the suffering. Also, many prescription drugs may have side-effects, like weak erections and low sex drive.

Many doctors feel that prostate disorders can be treated or prevented by giving the prostate gland the nutrition it lacks.

Recent scientific research has shown how to remedy the underlying problems associated with prostate disorders--safely and effectively. These results have been published in the *British Journal of Clinical Pharmacology,* the *American Journal of Gerontology,* and papers from *the National Cancer Institute.* They reveal that several vitamins, minerals and natural herbs can dramatically shrink the prostate and improve urinary performance in older men.

The most modern application of these healthy ingredients is found in **Prostsafe™** from Whitewing Labs. **Prostsafe** is the nutritional "tool kit" for men with benign prostate problems, and those who wish to prevent them. It is a mixture of zinc, serenoa serrulata, ginseng, certain amino acids, bee pollen and vitamins A, B-6 and E. Working as a team, these ingredients have been shown to shrink a swollen prostate.

Our customers have said Prostsafe helps to:

Halt the endless trips to the bathroom during the night!

Stop that burning sensation during or after urination!

Prevent uncontrollable wetting!

Improve bladder control!

Empty bladder completely!

Sit through an entire sports event !

Eliminate burning feeling!

Dr. Michael Rosenbaum, M.D. says "Prostsafe supplies essential vitamins, minerals and herbs needed to nourish and maintain a healthy prostate."

For as little as a dollar a day, that seems like inexpensive insurance against prostate disorders. If for some reason you are not satisfied, just return the unused portion within 30 days for a full refund.

The reasons why men over 40 use **Prostsafe** are clear. If you are looking for relief, order **Prostsafe™** today.

"Now I get a good night's sleep without getting up every two hours to urinate."
-- Mr. C. Hussy
Cleburne, TX

"I previously encountered discomforts such as bladder urgency. These problems are now completely absent."
-- Mr. B. Doser
Holland, MI

"Prostsafe has stopped the burning after urination."
-- Mr. C.E. Black
Barboursville, WV

"Before I used to have several bladder infections a year. Now I do not have any."
-- Mr. A. Simon
Charlotte, MI

"I empty my bladder and have a good stream of urine with no strain."
-- Mr. S.J. Hymel
Houma, LA

"I have less aches and stiffness"
-- Mr. K. Osmom
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SHOP TESTED

PRODUCTS THAT PERFORM

Continued from page 100

Benchtop drill press offers heavy-duty performance

If you normally associate Skil with portable power tools, the company's model HD3580 13" Benchtop Drill Press will change the way you think. To start, the 2⅞"-diameter steel column gives this drill press a reassuringly solid feel. The quill, with its 3¼" spindle travel, and the table-elevation mechanism, operate with smooth, solid precision. A 9×10" cast-iron table allows for a maximum 15½" chuck-to-table distance.

The HD3580 comes with a 1,720-rpm ⅓-hp induction motor and a ⅝"-capacity chuck. By changing the belt to different pulleys, you can change the chuck speed from 500 to 3,100 rpm. I found the belts and the belt tension easy to change.

The price of this drill press rates right up there with similar models from other manufacturers. What separates the Skil drill press, however, is its excellent fence. This cast-aluminum piece mounts on the column and provides a backstop and a vertical surface to which you can clamp workpieces. A centering rod included with the fence enables you to gauge the distance from the center of the chuck to the edge of the fence as shown in the photo *right*. Another accessory used in conjunction with the fence, an aluminum V-block, enables you to secure round or square stock on edge. Given the convenience and value of the fence, and the overall high quality of the rest of this machine, I think the new Skil drill press would make a good addition to any shop.

—Tested by Dave Henderson

PRODUCT SCORECARD

Skill Model HD3580 13" Drill Press

Performance	★ ★ ★ ★ ★
Price	About $320.00
Value	★ ★ ★ ★ ☆

Contact: S-B Power Tool Company, 4300 W. Peterson Ave., Chicago, IL 60646. Call 312/286-7330.

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23-700	Wet/Dry Grinder	234	155
23-710	New Sharpening Center	210	165
23-680	6" Bench Grinder 1/4 HP	86	69
11-950	8" Drill Press	199	128
31-050	1" Belt sander 2.0 amp	104	75
31-460	4" Belt/Disc Sander	198	129
40-560	16" 2 speed Scroll Saw	266	178
11-990	12" Bench Drill Press	276	184
11-090	32" Radial Bench Drill Press	399	305
43-505	1/2" Bench Router/Shaper	399	289
22-540	12" Bench Top Planer	Sale	385
	FREE Set of extra knives included !		
36-220	10" Compound Mitre Saw	350	215
28-180	Bench Band Saw	232	158
28-190	NEW 12" Band Saw	465	395
40-640	20" Bench Scroll Saw	466	295
37-070	NEW 6" w/spd Bench Jointer	337	258
14-650	Hollow Chisel Mortiser	668	289
46-700	12" Wood Lathe	548	449
33-990	10" Radial Arm Saw	818	695
37-280	6" Motorized Jointer	488	389
50-179	3/4 HP 2 stage Dust Collector	483	358
33-055	8-1/4" Sawbuck comp w/legs	865	629
36-040	8-1/4" Compound Mitre Saw	224	149
36-905	30" Unifence	385	249
36-906	50" Delta Unifence	525	299
36-755	10" Tilting Arbor Saw	1264	1039
17-900	16-1/2" Floor Drill Press	462	399
33-060	"Sidekick" Miter Saw	510	389
37-190	6" Deluxe Jointer	554	479
36-275	8-1/4" Builders Saw	444	265
36-210	10" Compound Mitre Saw	438	255
36-070	10" Mitre Saw	284	165
36-630	10" Contractors Saw II	700	579
34-555	Sliding Table	459	329
22-661	13" Planer w/ stand 2 HP	1513	1239
37-154	6" Jointer w/ mobile base	1451	1239
34-444	Contractors Table Saw	812	659
34-445	34-444 Saw w/30" Unifence	1200	829
	above saw comes w/ mobile base		
28-283	14" Band Saw w/enc. stand	910	779
	above saw comes w/ mobile base & fence		
36-250	NEW 10" Slide Compound Saw	825	489

MILWAUKEE TOOLS

6527	NEW Sawzall with case	320	174
6528	above Sawzall w/wired cord	316	174
0407-1	12V Drill w/kyls chuck & 2 batt		172
0406-1	9.6V Drill Kit with 2 batteries	332	159
0231-1	3/8" Drill 0-1700 rpm	148	95
0224-1	3/8" Drill 4.5 amp magnum	227	128
0234-1	1/2" Drill 4.5A mag 0-850 rpm	237	135
0244-1	1/2" Drill 4.5A mag 0-600 rpm	237	135
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	198	118
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	195	115
0375-1	3/8" close quarter Drill	237	139
0379-1	1/2" close quarter Drill	268	158
6546-1	cdls Scrwdvr 200 & 400 rpm	141	84
6547-1	6546-1 w/bits, 1/4" chuck, & cse	176	105
5399	1/2" D-hdle Hammer Drill Kit	332	194
6507	Original SawZall with case	264	152
5397-1	3.8" var. spd Hammer Drill Kit	255	142
5371-1	1/2" var. spd Hammer Drill Kit	340	188
3107-1	1/2" v/spd right angle Drill Kit	399	219
6754-1	Drywall Gun 0-4000 5.4 amp	196	114
3300-1	1/2" var. spd right angle Drill	356	209
5680	Router 2 HP w/ 1/4" & 1/2" collets	362	165
0235-1	1/2" Drill w/keyless chuck	237	138
6142	4-1/2" Grinder w/cse & access	208	124
6749-1	Drywall Gun 0-2500 5.4 amp	218	132
6365	7-1/4" Circular Saw 13 amp	218	125
6366	6365 w/fence & carbide blade	228	129
6368	6365 w/fence,carb. blde,& cse	249	139
6377	7-1/4" Worm Drive Saw	330	189
6256	Top Handle Jig Saw	264	154
6490	10" Mitre Saw	444	248
6491	6490 w/ carbide blade & bag	532	319
6494	10" Compound Mitre Saw	444	315
0422-1	NEW 12V Hammer Drill w/2 batt	430	249
0431-1	NEW 12V Drill w/ 2 batteries	385	229

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LU82M010	Cut-off	10" 60	93	45
LU84M011	Comb	10" 50	78	42
LU85M010	Super Cut-off	10" 80	115	59
LM72M010	Ripping	10" 24	69	38
LU73M010	Cut off	10" 60	84	45
LU87M010	Thin Kerf	10" 24	72	39
LU88M010	Thin Kerf	10" 60	88	45
LU98M010	Ultimate	10" 80	128	68
LU91M010	Compnd Mitre	10" 60	88	54
F410	NEW Quiet Blade	10" 40	95	49
F810	NEW Quiet Blade	10" 80	135	74
TK303	7-1/4" Finishing	40	38	25
TK906	10" Combo	50	53	32
SD308	8" Dado - Carbide		230	119
SD506	6" carbide w/case & shims		292	155
SD508	8" carbide w/case & shims		344	168
F10	2-1/8" x 3/4" Biscuit 1000 Qty		43	29
F20	2-3/4" x 1" Biscuit 1000 Qty		45	29
FA	Assorted Biscuits 1000 Qty		45	29
FB100	16 piece Forstner Bit Set		338	189
94-100	5 pc. Router Bit Door System		320	159
TR215	10" Slide Cmpd Mitre Saw		688	369

The following tool has a $20.00 rebate thru 1/31/96

FT2000E	3-1/4 HP v/sp Plunge Router	410	209

The following tools have a $30.00 rebate thru 1/31/96

JS100	Biscuit Jointer w/ case	334	164
JS102	Biscuit Jointer w/fence & case	355	179

MAKITA TOOLS

Model	Description	List	Sale
6172DWE	3/8" v/spd Drill Kit w/ 2 batt	220	109
5090DW	3-3/8" Saw Kit 9.6 volt	270	145
ML900	Incandescent Flashlight 9.6V	Sale	37
DA391DW	3/8" angle Drill Kit 9.6 volt	312	179
6012HDWE	2 speed Drill Kit w/2 batt	243	135
6095DWE	6095DW Drill Kit w/2 batteries	270	139
6095D	6095DW Drill only & case	Special	79
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28

NEW CORDLESS DRILLS
WITH HIGH CAPACITY BATTERIES

6202DWG	9.6V 3/8" Drill Kit w/ LED batt	390	219
6212DWG	12V 3/8" Drill Kit w/ LED batt	412	228
6312DWG	12V 1/2" Drill Kit w/ LED batt	432	239
6201DWHE	9.6V 3/8" Drill Kit w/ 2 batt	351	185
6211DWHE	12V 3/8" Drill Kit w/ 2 batt	368	195
6311DWHE	12V 1/2" Drill Kit w/ 2 batt	399	205
5007NBA	7-1/4" Saw w/electric brake	263	135
9900B	3" x 21" Belt Sander w/bag	344	175
9924DB	3" x 24" Belt Sander w/bag	329	189
4301BV	Orb. var. spd Jig Saw 3.5A	292	155
JR3000V	var. speed Recip Saw w/case	252	139
9820-2	Blade Sharpener	394	215
N1900B	3-1/4" Planer with case	244	129
N9514B	4" Disc Grinder 4.6 amp	111	65
B04552	1/4 sheet Pad Sander w/bag	98	55
DA3000R	3/8" Angle Drill	314	179
2708W	8-1/4" Table Saw	585	305
2711	10" Table Saw with brake	1067	589
6405	3/8" Drill Rev. 0-2100 rpm	112	68
6510LVR	3/8" Drill Rev. 0-1050 rpm	168	94
6013BR	1/2" Drill Rev. 6 amp	280	149
9401	4" x 24" Belt Sander w/bag	378	229
4303C	var. speed Orbital Jig Saw	351	205
5077B	7-1/4" Hypoid Saw	281	155
5007NB	7-1/4" Circular Saw 13 amp	232	124
5007NBK	5007NB Saw w/ plastic case	Sale	129
LS1011	10" Slide Compound Saw	946	525
LS1211	New 12" Slide Cmpd Saw	1550	795
3901	New Plate Joiner Kit	372	219

SENCO AIR NAILERS

SFN1	Finishing Nailer 1" - 2"	448	309
SN325	Nailer 1-7/8" - 3-1/4"	665	419
SLP20	New Pinner w/cse 5/8 -1-5/8"	399	278
SKS	Stapler 5/8" - 1-1/2"	390	275
SN70	Fram. Nailer Clip Hd 2"-3-1/2"	690	479
SN60	Fram. Nailer-Full Hd 2"-3-1/2"	638	449
SFN40	NEW Finish Nailer 1-1/4 - 2-1/2	571	389

BOSTITCH AIR NAILERS

N80S-1	Stick Nailer	Super Sale	348
RN45	Coil Roof Nailer 3/4 - 1-3/4	845	395
N60FN-2	Finishing Nailer	650	335
BT35-2	Brad Tacker 5/8" - 1-3/8"	275	159
BT35-2K	BT35-2 w/ case, oil, & brads	299	169
CWC100	1 HP Pancake Compressor	463	289
MIIIFS	Flooring Stapler 15 gauge	931	529
S32SX-1	Finish Stapler - 1/2" - 1-3/8"	275	159
S32SX-1K	S32SX-2 with case & oil	269	169
PC5000-1	NEW Power Crown Stapler	300	159

SKIL SIZZLERS

2735-04	12 volt cordless Drill Kit	249	144
2736-04	2735-04 with keyless chuck	269	148
1605-02	Biscuit Joiner w/case	221	135
3400	10" Table Saw - Bench Top	270	189
77	Famous 7-1/4" Worm Drive Saw	Sale	144
77M	NEW 77 Mag Worm Saw - 2 lbs lighter than Model 77	Sale	159

PANASONIC CORDLESS

EY6205EQK	Same as EY6205BC but comes with **Ironman** battery	368	195
EY6207BC	NEW 12 volt 1/2" Drill w/keyless chuck var. speed w/15 min. charger & case	420	222
EY6282EQK	Var. spd 9.6 volt Drill with 15 min. charger, case & NEW **Ironman** battery	315	169
EY62821DKW	9.6 volt Drill Kit w/2 batt.	395	162

NEW PREDATOR DRILLS

EY6181CRKW	NEW 9.6V Compact Drill Kit w/2 batt - 10% more pwr than EY62821DKW	305	165
EY6100CRKW	NEW 12 volt Drill Kit with 2 batteries, 1 hour charger, & case	358	188
EY6100CQKW	Same as EY6100CRKW but has 15 minute charger	420	198
EY6100EQK	NEW 12 volt Drill kit with NEW **Ironman** battery, 15 min. charger, & case	375	199
EY6100EQKW	Same as EY6100EQK but w/2 **Ironman** batteries	473	198

PASLODE IMPULSE GUNS

IM250	Trimpulse Finish Nailer Kit	849	548
IM325	Impulse Framing Nailer Kit	849	548

WAGNER PAINT & SPRAYER PRODUCTS

230HD	Power Painter/Sprayer	100	95
255	Airless Kit	180	135
375E	Airless System	195	164
505	High performance Airless Painter	440	369
HVLP	Fine coat finishing HVLP System	195	155
CS2000	Pro fine finish HVLP System	339	278

Airy Air Nailers

0241SK
Brad Nailer 3/8"-1 9/16"
Same as Senco SLP-20
List 180 Sale 98

0250SK
Brad Nailer 3/4"-2"
List 296 Sale 164

0626SK
1/4" Crown Stapler 3/8"-1"
List 194 Sale 104

0635SK
1/4" Crown Stapler 1/2"-1-3/8"
Same as Senco SKS
List 310 Sale 175

EZ-1
New Multi-purpose nailer & stapler
List 180 Sale 98

Above Nailers come w/case, fasteners, oil & wrenches

0565T
Angle Finish Nailer 1"-2-1/2"
List 386 Sale 205

DELTA
#34-080
10" MITRE BOX
XTRA SPECIAL
194.00

DEWALT TOOLS

Model	Description	List	Sale
DW364	7-1/4" Circ. Saw w/brake	285	158
DW945K-2	12V cdls Drill Kit w/2 batt	309	179
DW944K-2	9.6V cdls Drill Kit w/2 batt	283	165
DW610	1-1/2 HP 2 handle Router	274	149
DW411	1/4 sheet Palm Sander	97	58
DW100	3/8" Drill, 4 amp,0-2500 rpm	118	68
DW682K	**Biscuit Joiner with case**	429	219
DW705	12" Compound Mitre Saw	706	359
DW625	3 HP var. spd PlungeRouter	Sale	275
	DW625 Router comes with FREE DW6966 Fine Depth Adjuster!		
DW930K	NEW 12V 5-3/8" Trim Saw Kit	370	199
DW935K	NEW 14.4V 5-3/8" Trim Saw Kit	444	237
	DW935K comes with FREE DW9091 battery!		
DW675K	3-1/8" Planer with case	289	164
DW431	3 x 21 v/spd Belt Sander	331	184
DW421	5" Palm Random Orbit Sander	125	74
DW444	6" Ran Orb Sander-PSA pad	266	139
DW443	DW444 w/hook & loop pad	266	139
DW673K	NEW Laminate Trimmer Kit	364	215
	DEWALT CORDLESS DRILLS		
DW952K	3/8" v/spd w/two 9.6V batt	280	145
DW953K	3/8" v/spd w/one 12V batt	306	175
DW962K-2	3/8"v/sp w/two 9.6V XR batt.	324	179
DW972K-2	3/8"v/sp w/two 12V XR batt.	352	189
	above drill comes with FREE bit set!		
DW991K	3/8"v/sp w/one 14.4V XRbatt	370	199
DW991K-2	above drill w/ 2 batteries	Sale	225
	Above drill kits come w/ charger & steel case!		

HITACHI TOOLS

C8FB	8-1/2" Slide Compound Saw	1400	575
C10FS	10" Slide Compound Saw	1595	745
P12R	12-9/32" Planer	1470	795
P12RA	Planer/Joiner	1940	995
G12SA	4-1/2" Grinder 6.9 amp	160	89
NR83A	Fram Nailer 2 - 3-1/2 Full Head	700	409
NR83AA	Framing Nailer 2 - 3-1/2	750	425
NT65A	16 ga. Brad Nailer 1 - 2-1/2	610	339
NV45AB	Coil Roofing Nailer 7/8 - 1-3/4	750	435

BIESEMEYER FENCES

B-50	50" Commer. Saw Fence	345	298
T-SQUARE 52	52" Homeshop Fence	279	238
T-SQUARE 40	40" Homeshop Fence	259	208
T-SQUARE 28	28" Homeshop Fence	249	198

JORGENSEN ADJUSTABLE HANDSCREWS

Item#	Jaw Length	Open Cap	List	Sale	Box of 6
#0	8"	4-1/2"	19.76	11.75	58.00
#1	10"	6"	22.63	12.50	68.00
#2	12"	8-1/2"	25.95	14.50	76.00

PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
50	3/4" Black Pipe Clamps	14.87	7.80	88.95
52	1/2" Black Pipe Clamps	12.40	6.70	71.50

BOSCH

Model	Description	List	Sale
1587VS	NEW Top Hand "CLIC" Jig Saw	292	149
1584VS	NEW Barrel "CLIC" Jig Saw	285	149
Bosch Metal Case for above Jig Saws		34	32
Bosch 30 blade assortment for Jig Saws			28.99
	1584VS or 1587VS with steel case and 30 Bosch blades	Sale	189
1272D	3" x 24" Belt Sander with bag	375	209
1273D	4" x 24" Belt Sander with bag	380	218
1347AK	4-1/2" Grinder w/cs & access.	185	109
1194VSR	1/2" var. speed Hammer Drill	282	155
1194VSRK	above Hammer Drill w/case	313	169
1609K	Lam Installers Kit with 1609	343	189
1609KX	Deluxe Installers kit	405	234
1604A	1-3/4 HP 2 Handle Router	250	142
1604AK	same as above w/cse & acc	316	185
1606A	1-3/4 HP D-handle Router	295	179
3270DVS	3 x 21v/spd belt sander w/ bag	270	165
1273DVS	var. spd 4" x 24" Belt Sander	415	228
1614EVS	1-1/4HP v/spd Plge Router	283	159
1613EVS	2HP v/sp Plunge Router	359	199
1615EVS	3 HP v/spd Plge Router	505	289
1632VSRK	Recip Saw 8.4A orb-v/spd	225	159
3050VSRK	9.6V cdls v/sp Drill Kit comp	288	149
3051VSRK	3050VSRK w/keyless chuck	299	149
3054VSRK	12V Drill Kit w/ 2 batteries	330	185
3300K	NEW 12V Drill Kit w/ 2 batt	348	189
3310K	NEW 12V T-handle Drill Kit	348	189
3110K	NEW 9.6V T-handle Drill Kit	320	185
3283DVS	5" Random Orbit Sander	169	98
3283DVSK	3283DVS Kit complete	199	118
3725DVS	NEW 5" Random Orbit Sander	258	149
3727DVS	NEW 6" Random Orbit Sander	268	154
B1650K	NEW Biscuit Joiner	289	159
B7000	NEW Corner Detail Sander	122	68
B7001	B7000 w/ variable speed	156	95
B4050	NEW In Line Jig Saw	199	115
11230EVSN	NEW SDS-max 1-1/2" Rtry Hmr	885	525
11231EVSN	NEW SDS-max 1-3/4" Rotary Hammer	1336	809
11223EVSN	NEW SDS-max 2" Rotary Hmr	1548	929

AEG POWER TOOLS

Model	Description	List	Sale
TXE150	6" var/spd Ran Orb Sander	304	139
HBSE75S	3"x21" var/spd Belt Sander	309	179
BSPE100X	Top Handle Jig Saw w/case	286	164
FSPE100X	Barrel Grip Jig Saw w/case	274	164

PORTA NAILER

401	Porta Nailer complete	265	205
501	Face Nailer complete	265	205

BLACK & DECKER

2694	7-1/4" Super Sawcat w/case	285	158
2695	8-1/4" Super Sawcat w/case	328	179

DAVID WHITE

LP6-20	Sight Level package - 20x	310	205
LP6-20XL	LP6-20 w/9056 tripod & 7620 rod		265
LT8-300	Level Transit - 26x	695	439
LT8-300P	above Level w/optical plum	821	518
LT6-900	Level Transit - 20x	389	254
ALT6-900A	Automatic Level - Transit -18x	638	395
ALTP6-900A	above Level w/tripod & rod	708	495
ALP6-18HD	above Level w/tripod & rod	570	385
ML100I	NEW Laser Level	1099	945
ML100	NEW Laser Level w/detector	1249	1075

RYOBI SPECIALS

RE600	3 HP Plunge Router	500	228
BE321	3" x 21" var. spd Belt Sander	310	148
TFD222VRK	12V cordless Drill Kit	365	149
BT3000	10" Table Saw with stand	1125	529
AP12	12" Bench Planer	884	395
BS900	9" Bench Band Saw	340	165
OSS450	Oscillating Spindle Sander	340	159
DC500	NEW Detail Carver	120	64
TSS200	NEW 8-1/2" Slide Comp. Saw	895	399

SIOUX TOOLS

8030	New 3/8" var/spd Drill	250	145
8000	3/8" var/spd close qtr Drill	201	125
690	5" Air Random Orbit Sander	139	132
Msx636 FEIN	Triangle Sander Kit	Sale	199
Msx625 FEIN	New Air Triangle Sander	Sale	189
Lamello	New Cordless Biscuit Joiner	695	549
LPN672 PONY	Air Palm Nailer w/glove	Sale	94.99
RTM01 ROTOZIP	Drywall cut out unit		68.95

QUAL-CRAFT PRODUCTS

2200	Pump Jack	79	58
2201	Pump Jack Brace	30	20
2203	Pump Jack guard rail holder	31	21
2204	Workbench & rail holder combo	53	39
	Buy any 6 (can be assort.) deduct 10%		
2601	Wall Jack	167	108
	Lots of 4 deduct additional 10%		

PORTER CABLE

444	Profile Sander	157	94
9444	Profile Sander Kit	205	119
7499	Ultimate Cut-out tool	113	69
690	1-1/2 HP Router 8 amp	260	138
691	1-1/2 HP Router D-handle	285	155
693	1-1/2 HP Plunge Router Base	320	174
6931	Plunge Router Base	125	79
695	1-1/2 HP Router/Shaper	400	229
696	Heavy Duty Shaper Table	230	135
351	3" x 21" Belt Sander w/o bag	280	158
352	3" x 21" Belt Sander with bag	280	165
352VS	3x21 Belt Sander w/bag v/spd	305	169
360	3" x 24" Belt Sander with bag	365	198
361	3" x 24" Belt Sander w/o bag	345	194
362	4" x 24" Belt Sander with bag	380	208
97751	1/2" v/spd Hammer Drill w/cse	270	155
9118	Porta Plane Kit 7 amp	390	218
505	1/2 sheet Pad Sander	230	128
7549	Top handle Jig Saw 4.8 amp	270	135
330	Speed Block Sander 1/4 sheet	110	62
556	Biscuit joiner w/5556 tilt fence	Sale	139
345	6" Saw Boss 9 amp	190	109
9345	345 comp. w/cse & carb blde	220	128
9647	TIGER CUB Recip. Saw	210	119
9637	Full var/spd Recip Saw 8 amp	270	148
7519	3-1/4 HP Router 2 Handle	445	239
7518	3-1/4 HP 5 speed Router	510	275
7538	3-1/4 HP Plunge Router	445	242
7539	3-1/4HP w/spd Plunge Router	510	269
7399	5.6 amp Drywall Cutout Unit	140	84
7310	5.6 amp Laminate Trimmer	165	95
97310	Laminate Trimmer Kit comp	360	198
7335	5" Rndm Orbit Sndr w/ case	245	135
97355	7335 w/ case & dust pick-up	274	138
7336	6" Rndm Orbit Sander w/ case	250	139
97366	7336 w/ case & dust pick-up	284	144
73333	Dust Collection system	31	24.50
9853	12V 3/8" Drill Kit	280	154
9855	12V 1/2" 2 spd,v/sp Drill Kit	335	178
8500	12V battery for above drills	Sale	45
332	Palm Grip Rndm Orbit Sander	120	69
333	above Sander with dust bag	135	75
334	333 Sander with PSA pad	135	74
340	1/4 Sheet Orb Sndr w/dust p/u	89	55
550	Pocket cutter with case	330	179
7700	10" "Lazerloc" Mitre Saw	634	345
310	Production Laminate Trimmer	250	145
347	7-1/4" "Framers" Circ Saw	225	129
347K	347 Saw w/ plastic case	250	134
743	347 Saw - left hand version	225	129
743K	743 Saw w/ plastic case	250	134
9743	743 Saw with case	255	139
447	347 Saw with brake	225	134
843	447 Saw-left hand version	245	139
7800	Drywall Sander	585	329
7810	Wet/Dry Vac for above sander	455	259
9737	New Tiger Recipro Saw	290	165

FREE FREIGHT TO THE CONTINENTAL STATES ON EVERY ITEM • GIFT CERTIFICATES NOW AVAILABLE

Circle No. 92

FINISHING TOUCHES

OHIO WOODWORKERS TRIM A TREE

For each of the last 18 years the Women's Auxiliaries of Children's Hospital in Columbus, Ohio, have sponsored a Festival of Trees as a fund-raiser. Last November, 109 themed trees were donated to the festival by area individuals, businesses, clubs, and organizations. Many of the decorated trees were awarded prizes in different categories, then auctioned off to the highest bidder.

Club members got rolling making tree trims for charity. These turned ornaments by one member were just part of the nearly 500 done by the group.

According to David Loy, president of the Woodworkers of Central Ohio woodworking club, the tree decked out by members sold for $4,000! "It also won First Prize in the handcrafted category, which had about 30 entries," he says. "The club members produced nearly 500 ornaments—both turned and scrollsawn—to trim the 6½' tree. And we brightened it up with 2,200 lights."

This 6½'-tall tree, cheerily trimmed by a woodworking club, sold for $4,000 at Columbus, Ohio's Festival of Trees auction. It won a blue ribbon, too.

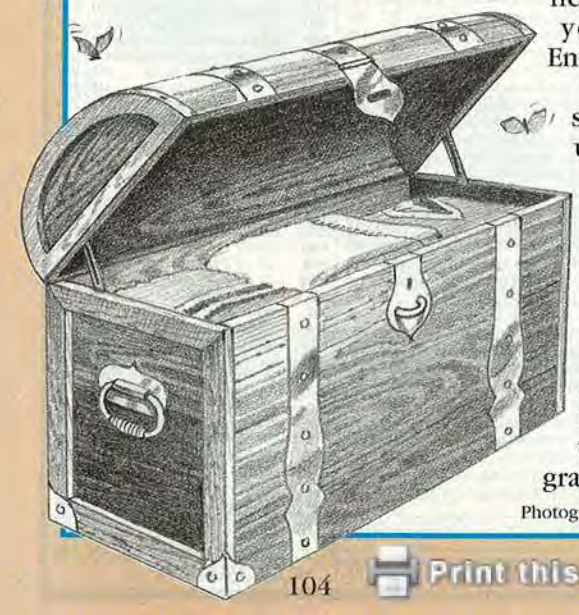
David says the money-raising project cost the club about $260 in out-of-pocket expenses. But $200 of that was covered by a Columbus woodworking-supply store, Wood Werks Supply, Inc. "It was a great morale booster for the club, as well as a lot of fun," sums up David.

Oh Christmas tree, oh Christmas tree

Close to 90 percent of all Christmas trees in the United States come from tree farms, says the National Christmas Tree Association, and all 50 states (even Hawaii) have such farms. In all, Christmas tree farms cover about one million acres, with each acre of growing trees producing enough oxygen every day to meet the requirements of 18 people. And for each tree harvested, usually 10 more are growing to desired height. Growers promptly replace cut trees with evergreen seedlings.

GRANDMA WAS RIGHT, ADMITS EPA

Who hasn't heard that eastern red (aromatic) cedar repels moths and mildew? That's why trunks, chests, and closets have been lined with the wood for generations, right?



Until lately, though, that notion was legally nothing but hearsay. Then, in March of last year, the U.S. government's Environmental Protection Agency (EPA) granted de-regulation status to natural cedar products. EPA's move means recognition of natural cedar products as a safe way to chase away moths, fleas, and mildew. Manufacturers of such products now can promote them as natural alternatives to pesticides and chemical mothballs without registering them with the EPA. To all you woodworkers, that means grandma *was* right after all!

Photographs: David Loy Illustrations: Jim Stevenson

In Japan, there's spirit in the wood

The Japanese people's fondness for wood may be due to the influence of Shinto, Japan's indigenous religion. Shinto professes that almost every living thing—including a tree—possesses a spirit. That's why traditional woodworkers and carpenters in that island nation strive to put a tree's wood to use for things of beauty that will ensure the tree's continued existence.

PROOF THAT THE APPLE DOESN'T FALL FAR FROM THE TREE.

FREE CARBIDE BLADE • FREE TABLE SAW BOOK • FREE SHOP APRON •
LIMITED TIME BONUS

See your Delta dealer for details.

We've never set out to copy our Unisaw. But we've certainly learned a lot from it over the years. Most importantly, how to build a quality saw to fit the needs of its owner. Which is why we build more types and sizes of saws than any other company in the business. All with the heft and precision we put into our professional saws.

Take our new 10" Contractor's Saw II,™ for instance. Built with a massive cast iron carriage and trunnion assembly, topped off with a 20"x27" cast iron table and solid steel extension wings. Its powerful 1½ HP motor and Jet-Lock® rip fence give you accuracy and capacity enough for the long haul.

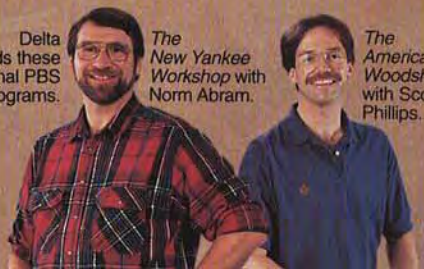
Admittedly, we have an advantage when it comes to making and selling saws. All those years of building tools for professionals would seem to say that Delta would be a pretty good place to start, if you're in the market for a good bench saw or a cabinet saw or any saw in between. We figure you shouldn't have to be a professional in order to work like one.

THE POWER OF THE PROS

DELTA
WOODWORKING MACHINERY
A Pentair Company

For the name of the nearest dealer, home center or hardware store carrying Delta Tools, call Delta International Machinery Corp., 800-438-2486. In Canada, 519-836-2840.

Delta funds these national PBS programs.



The New Yankee Workshop with Norm Abram.

The American Woodshop with Scott Phillips.

First we changed the rules. Then we stretched them.

Dodge Ram Club Cab lets you do something you thought you'd never do in the back seat of a pickup. Relax. Since there's more hip room than other club cabs, back seat passengers can spread out. The seat cushion is deeper, providing added support for longer trips. And when we say that our pickup is the most comfortable full-size club cab you can buy, we have the material to support it. In the form of a patented fabric, with fibers that act as a shock absorber. It's like having a suspension system just for the back seat.

It's easy to climb in and out, too. Because both sides of the 40/20/40 front bench tip and slide forward. Safety doesn't take a back seat, either. A driver's airbag comes standard.[1] And we've made available four-wheel anti-lock brakes.

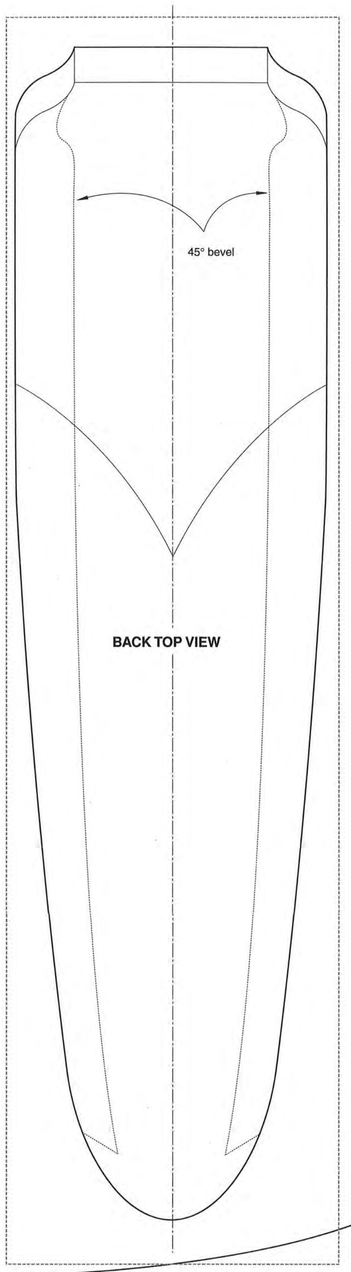
You've got plenty of power, courtesy of Dodge Magnum® engines–overall the most powerful line of truck engines on the planet. And you've got some powerful assurance down the road, as well. Dodge Ram has better resale value than Ford, Chevy or GMC.[2]

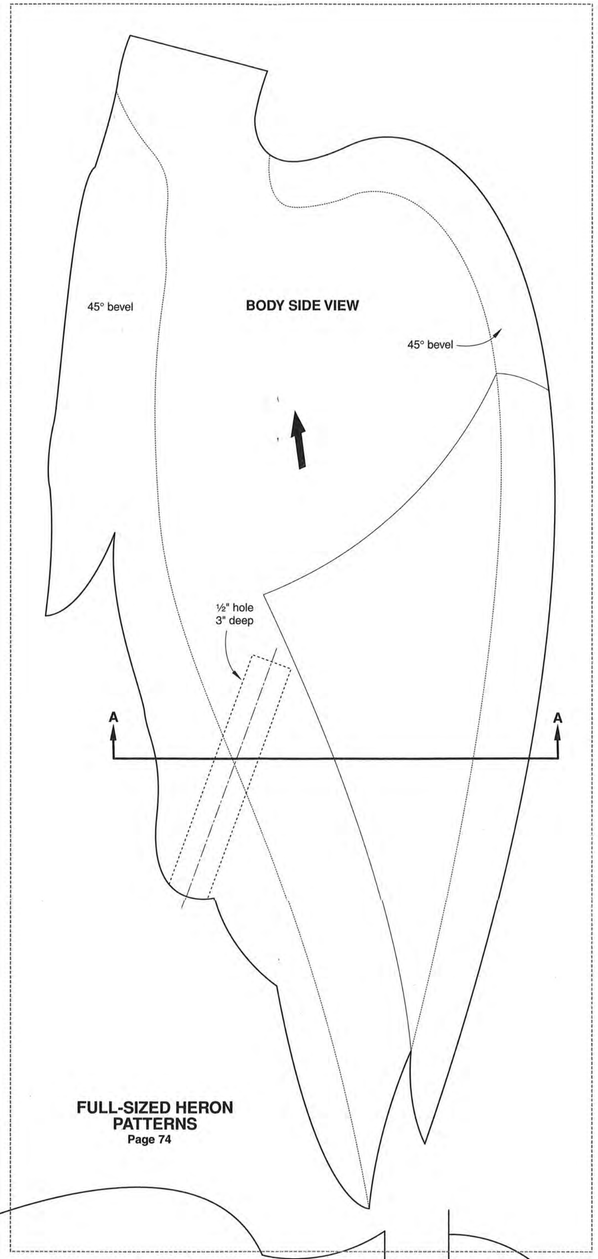
Sit back and make yourself comfortable. Front or back, you'll find that we've made plenty of room. For still more information, call 1-800-4-A-DODGE.

America's Truck Stop

The New Dodge
A DIVISION OF THE CHRYSLER CORPORATION

[1] Always wear your seat belt for a fully effective airbag. [2] We calculated resale using avg. trade-in values of '94 full-size models vs. MSRPs, published in Jan.-July '95 *N.A.D.A. Official Used Car Guide®* monthly editions. Use of these values does not constitute NADA's endorsement.





FULL-SIZED HERON PATTERNS
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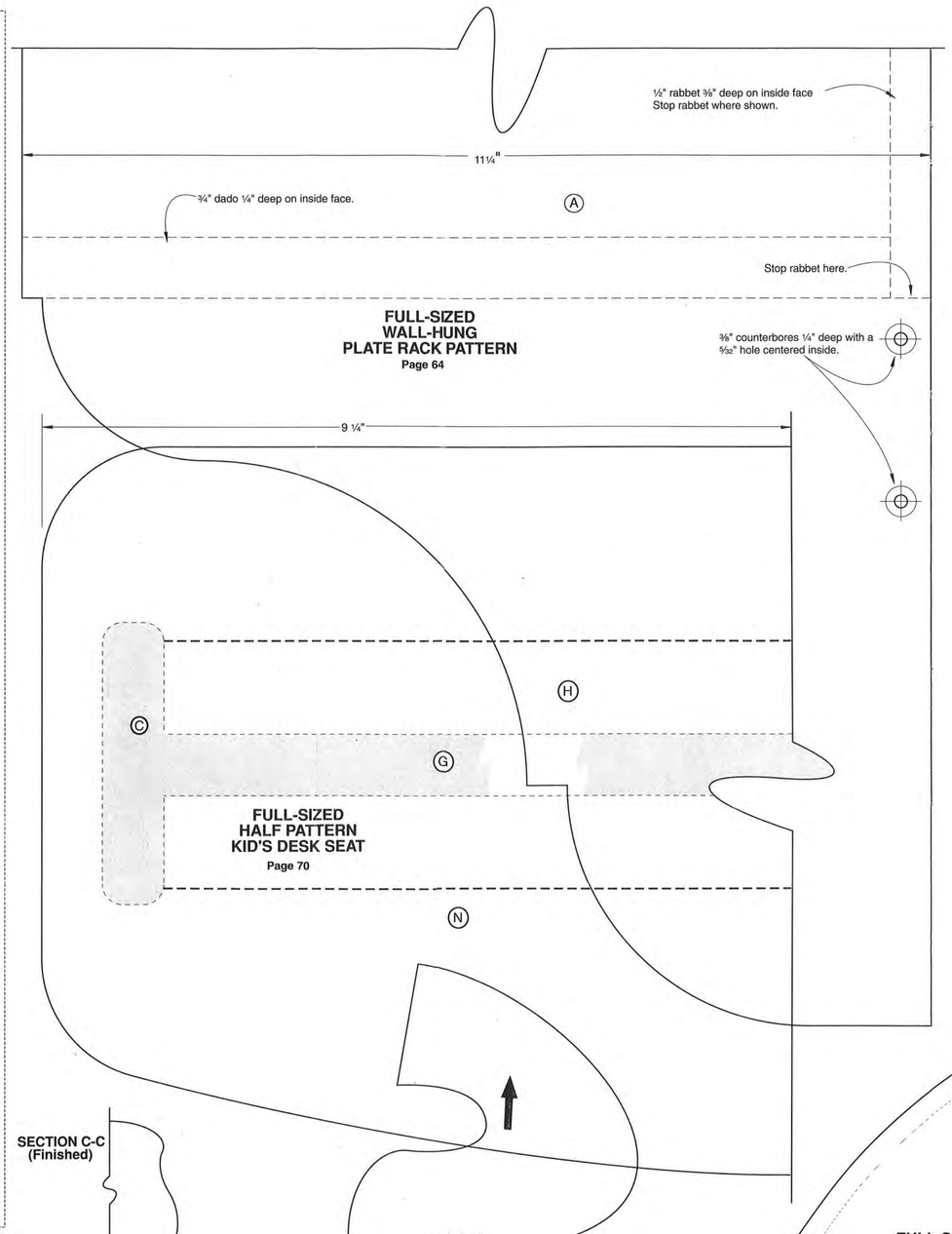
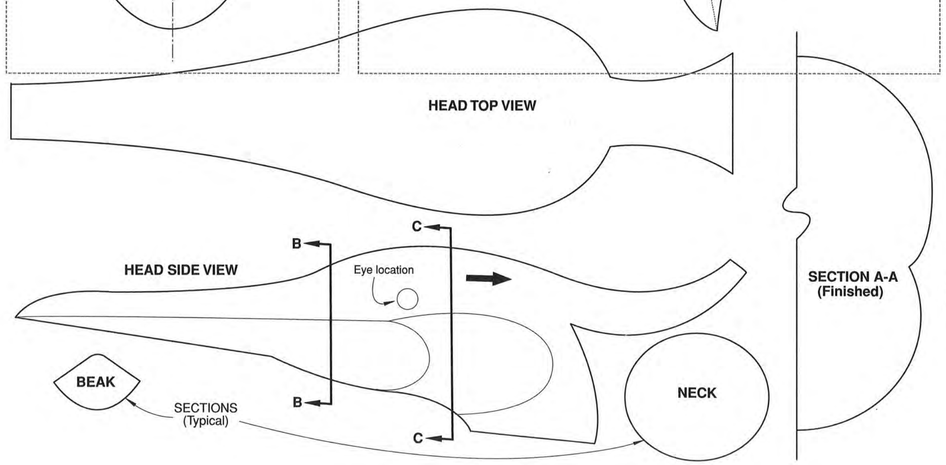
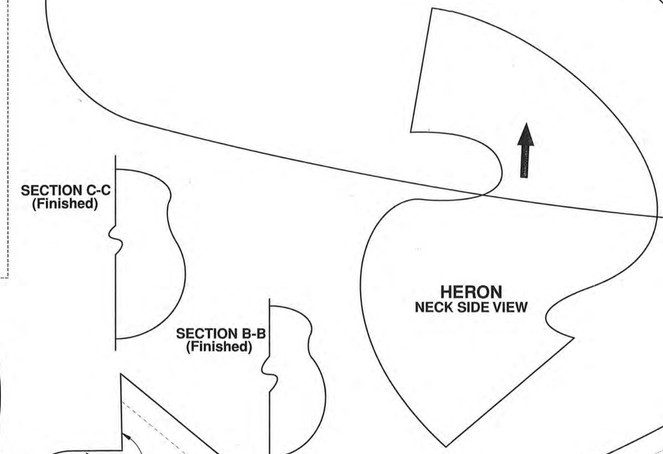
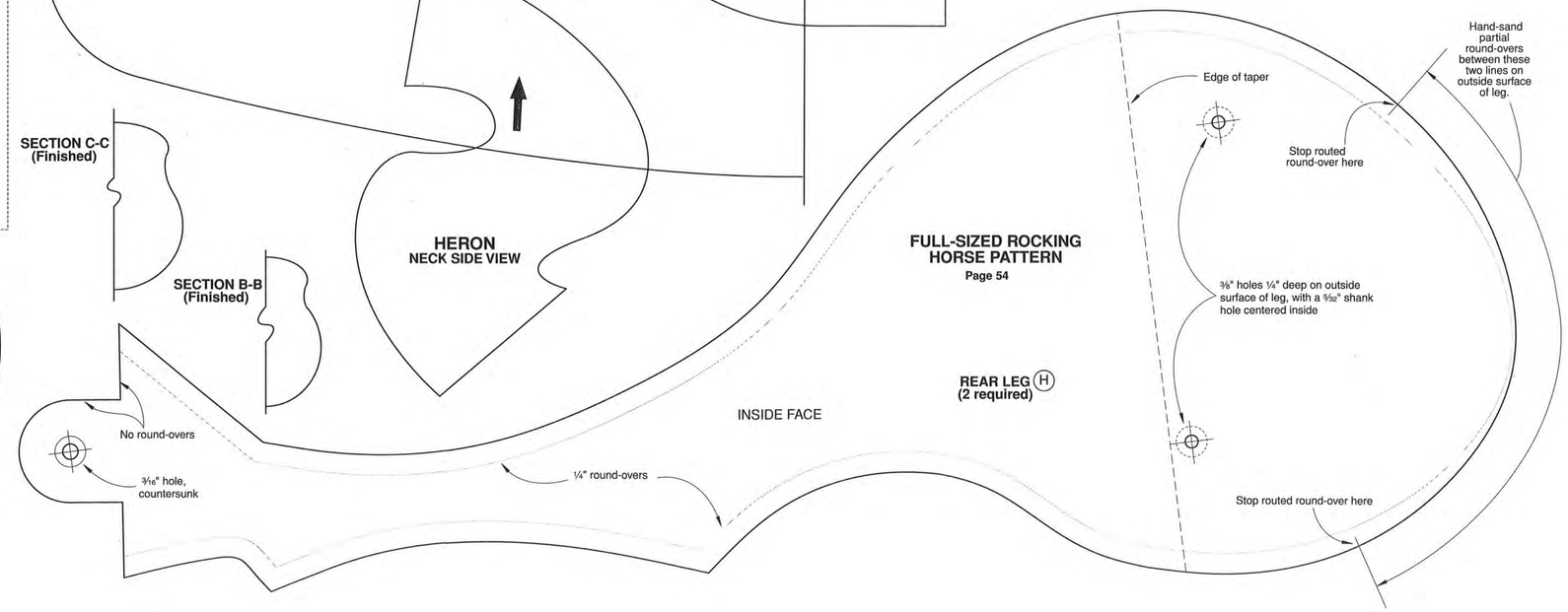


FULL-SIZED
WALL-HUNG
PLATE RACK PATTERN
Page 64

FULL-SIZED
HALF PATTERN
KID'S DESK SEAT
Page 70





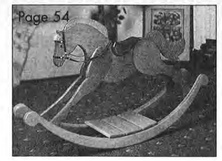


FULL-SIZED ROCKING
HORSE PATTERN
Page 54

Better Homes and Gardens®
WOOD® PATTERNS™
Full-sized for your woodworking convenience

NOVEMBER 1995 **ISSUE 83**

Dear Reader: As a service to you, we've included full-sized patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Bill of Materials and the drawings accompanying the project you're building.



- Rocking horse
- Plate rack
- Kid's desk
- Heron carving

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FULL-SIZED ROCKING HORSE PATTERNS

Page 54

BODY (A)

¾" hole for handle (optional)

Mane location

Round-over stops here

Forelock location

1/16" hole for bridle

½" hole

Eye-socket location

1/16" holes for bridle

No round-overs

¼" cove drilled ⅛" deep with a 1/16" hole centered inside for nostril

½" holes

EYE SOCKETS (M)

7/64" pilot holes

Align 5/32" holes in legs (G) and (H) with 7/64" pilot holes in body to position legs.

⅜" holes 1 1/16" deep

Dowel-hole alignment marks

No round-over

HANDLE (N)

1/16 x 1/16" glue grooves

½"

¾"

7½"

⅜" holes 1 1/16" deep

Dowel-hole alignment marks

Round-over stops here

7/64" pilot holes

STEP 1. Cut along solid line.

6"

1"

FORELOCK (D)

STEP 2. Rout ¼" round-over along cut edge.

STEP 3. Cut along dashed line, longer line first, to finish shaping forelock. No round-overs here.

½" round-overs

SADDLE SIDES (E) (2 required)

SADDLE CENTER (F) (2 required)

Stop routed round-over here

Sanded round-over

Hand-sand partial round-overs between these two lines on the outside surface of leg.

Edge of taper

⅜" hole ¼" deep on outside surface of leg, with a 5/32" shank hole centered inside

Stop routed round-over here

No round-over

3/16" hole, countersunk on inside surface of leg

¼" round-overs

FRONT LEG (G) (2 required)

INSIDE FACE

See pattern for rear leg (H) on opposite side.

No round-over on edge that mates with horse body.

¼" round-overs

MANE (C)

TAIL (B)

¼" round-over

No round-over

Join patterns here (align pattern joint line with joint line on part (I))

⅛" pilot hole ¾" deep

Front-hoof location

ROCKER FRONT (I), (J), AND (K)

¼" round-overs

INSIDE FACE

⅛" pilot hole ¾" deep

Rear-hoof location

Join patterns here (align pattern joint line with joint line on part (I))

ROCKER REAR (I), (J), AND (K)

INSIDE FACE

¼" round-overs